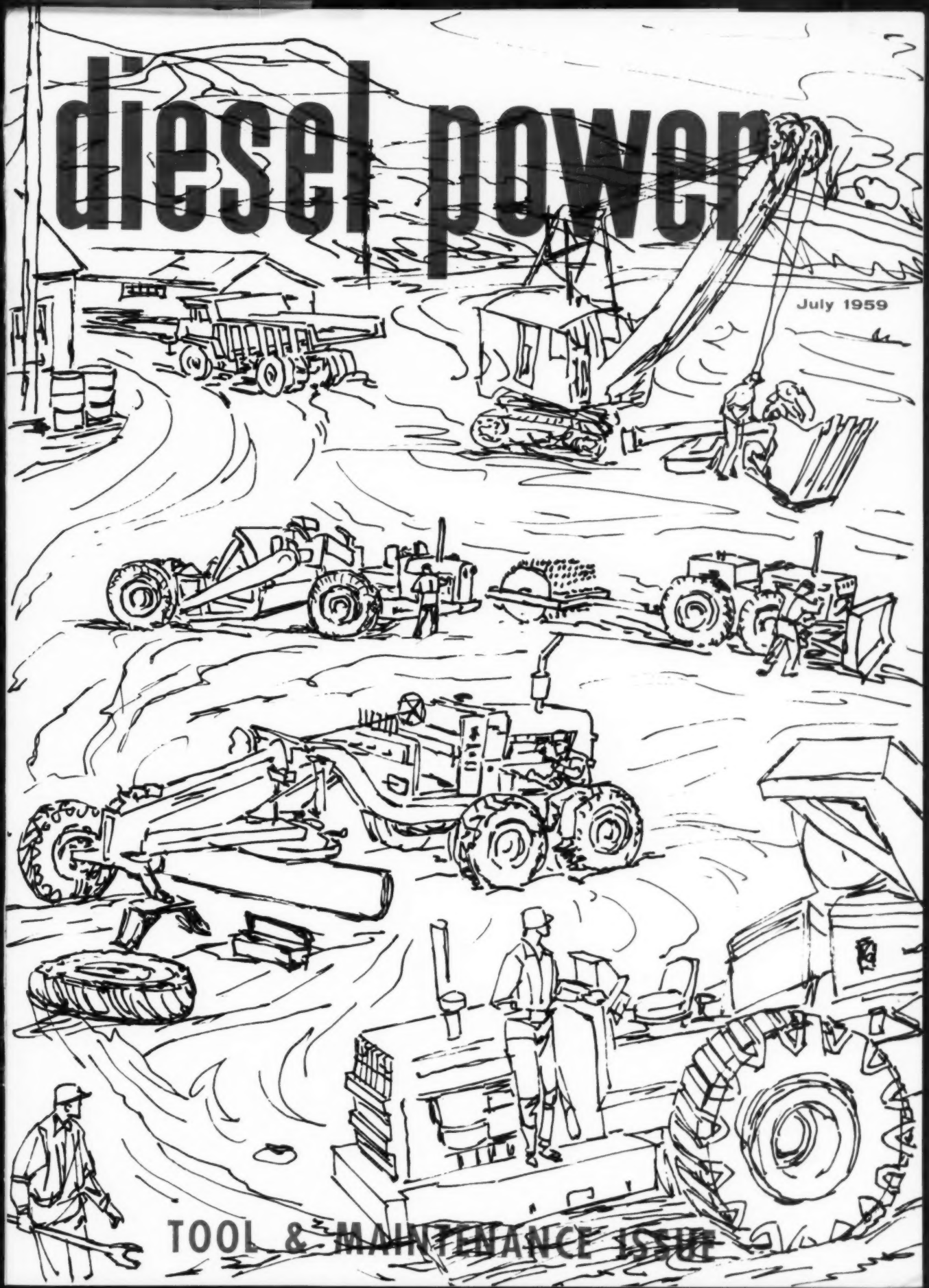
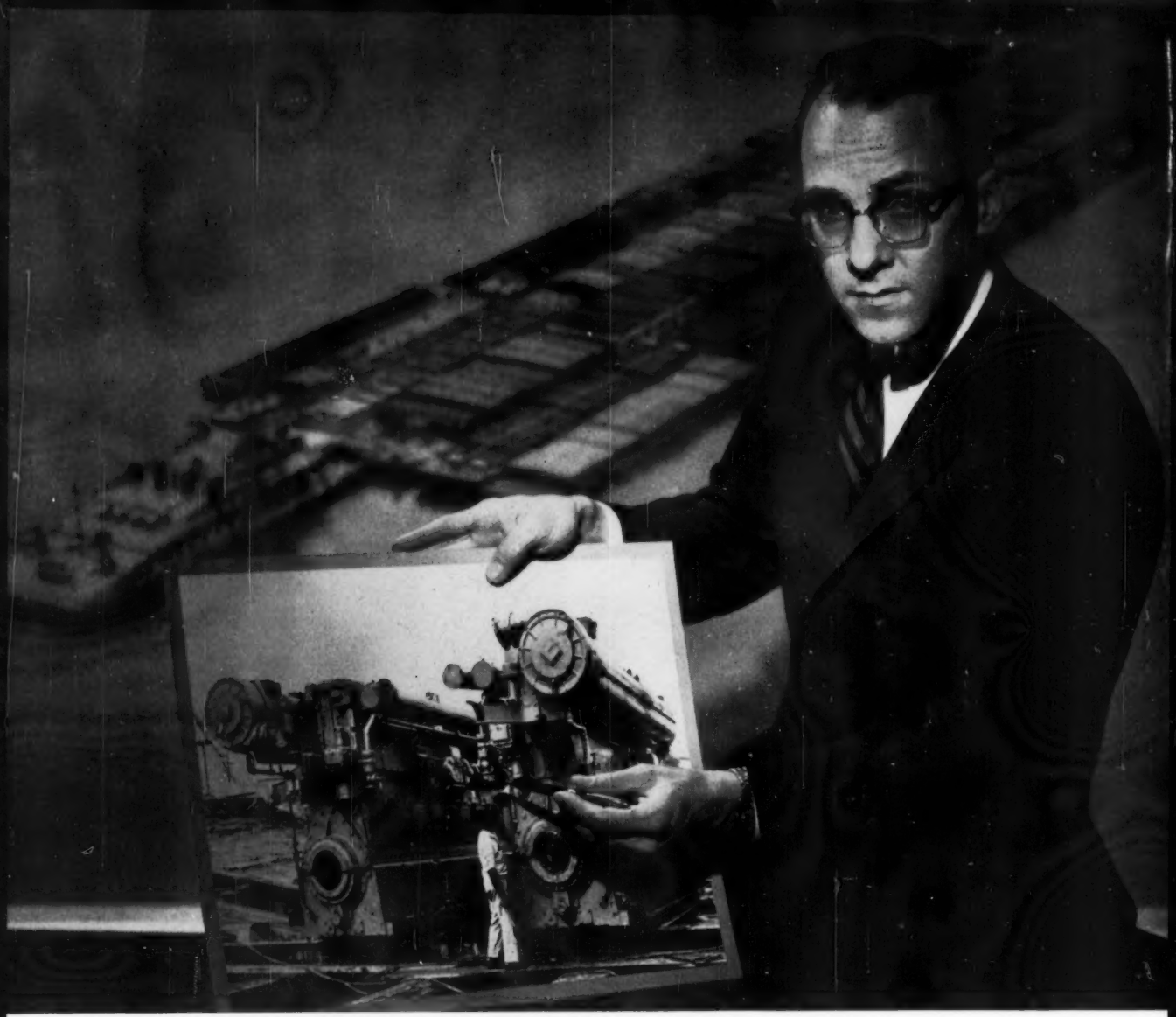
diesel power

July 1959



TOOL & MAINTENANCE ISSUE



Richard L. Spetka, *Manager Power Engine Sales,*
The Cooper-Bessemer Corporation, explains...

How river shipping now gets its biggest push

In the background, you see a tow of 40 barges, typical of cargo-moving records now being made on the lower Mississippi by the mighty towboat *United States*. And, the picture in my hand shows two of the four Cooper-Bessemer turbocharged diesels that give this towboat an 8500 horsepower push.

This world's record towboat can trim 30% off running time on normal tows, and compared to towboats of 20 years ago, can push three times the tonnage. Further economy is provided by the design of the engines to burn low-cost bunker C fuel oil, saving an estimated $250 per day.

The M/V *United States* is owned and operated by Federal Barge Lines and was built by St. Louis Shipbuilding and Steel Company.

Transportation is another field in which Cooper-Bessemer applies its engineering know-how and manufacturing skills to save you money. Call on us for assistance in your planning of power or compression facilities.

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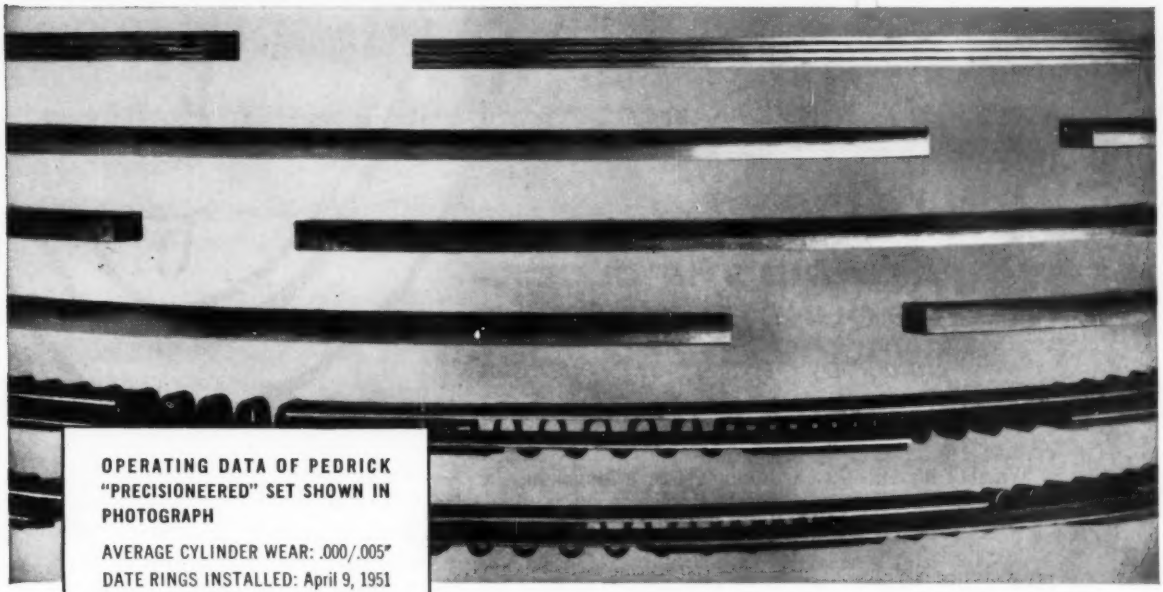
40,622 hours of operation

. . . an average of 6,350 h.p. hrs. per gal. total lube oil consumption.

The photograph shows Pedrick Piston Rings removed from a Cooper-Bessemer GMVTF 10 cylinder engine after 40,622 hours of operation. Note carefully how the face-wear on the rings (the bright area) extends only half way up. After more than six years of *full load* service, these Pedrick rings are practically as good as new.



OPERATING DATA OF PEDRICK "PRECISIONEERED" SET SHOWN IN PHOTOGRAPH

AVERAGE CYLINDER WEAR: .000/.005"

DATE RINGS INSTALLED: April 9, 1951

DATE RINGS REMOVED: June 27, 1957

TYPE LUBE OIL: DTE No. 3 MAGNOLIA

RATED HORSEPOWER: 1100

MAXIMUM OVERLOAD: 10%

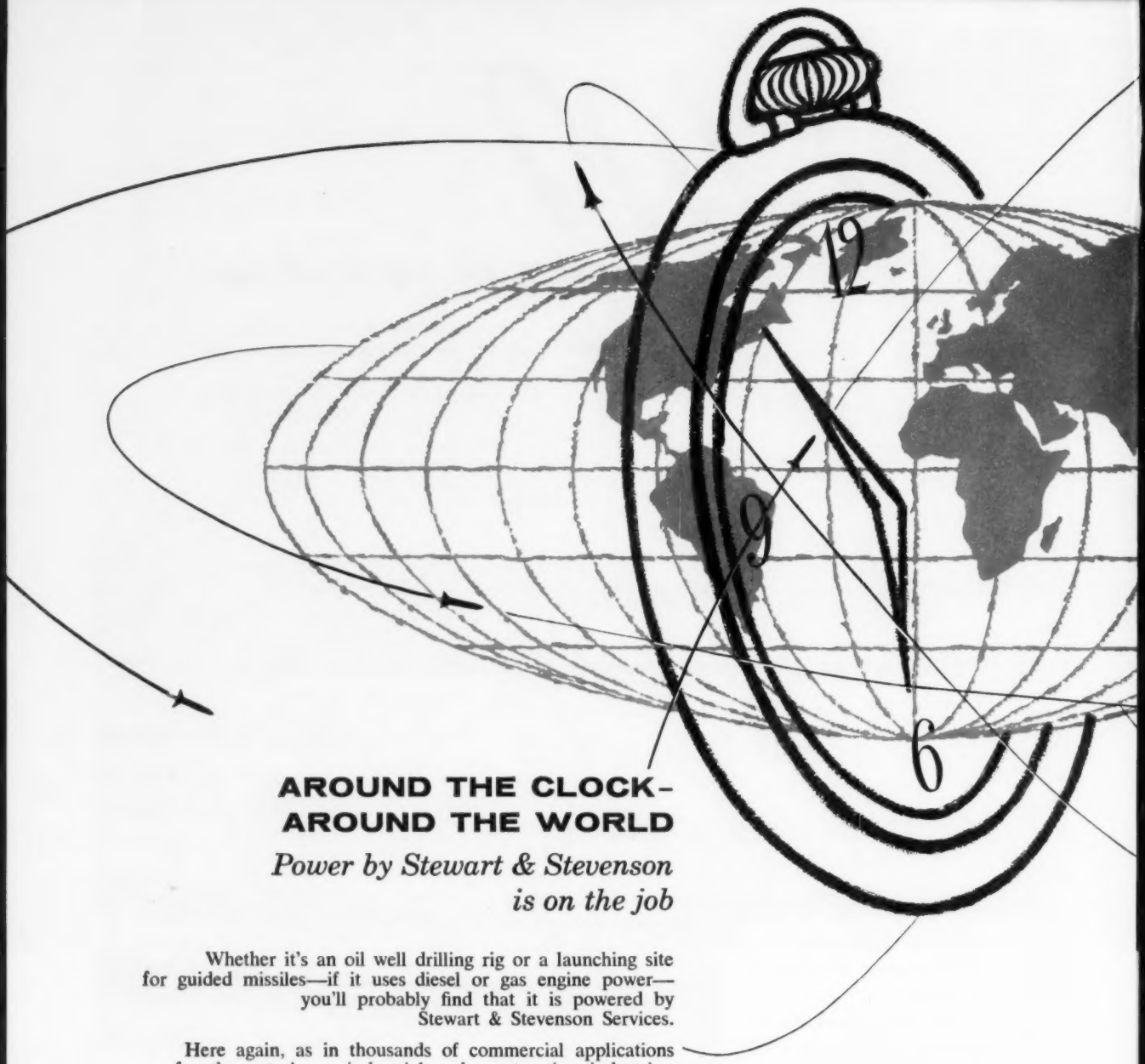
LUBE OIL CONSUMPTION: CRANKCASE—39,600 H.P. Hours per Gal. LUBRICATORS—(14 qts. per day) 7,530 H.P. Hours per Gal.

TOTAL LUBE OIL CONSUMPTION (CRANKCASE AND LUBRICATORS): 6,350 H.P. Hours per Gal.

For longer life at full power, make Pedrick "Precisioneered" Piston Ring Sets your *standard* replacement sets. You'll find your Pedrick engineer will be glad to call and help you solve any special problems. Write, wire or phone:
WILKENING MANUFACTURING CO., Phila. 42, Pa.
In Canada: Toronto 2.

Pedrick PISTON RINGS

PEDRICK PIONEERED CONFORMABLE PISTON RINGS FOR BIG-BORE ENGINES



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Many other Hall-Scott engines have passed the million-mile mark . . . and there will be many more. In fact, a unique Million-Mile Club has been formed of operators owning these long-serving power plants: note the certificate at left.

If you'd like to know more about these money-saving engines, write Hercules or any of its distributors coast-to-coast.

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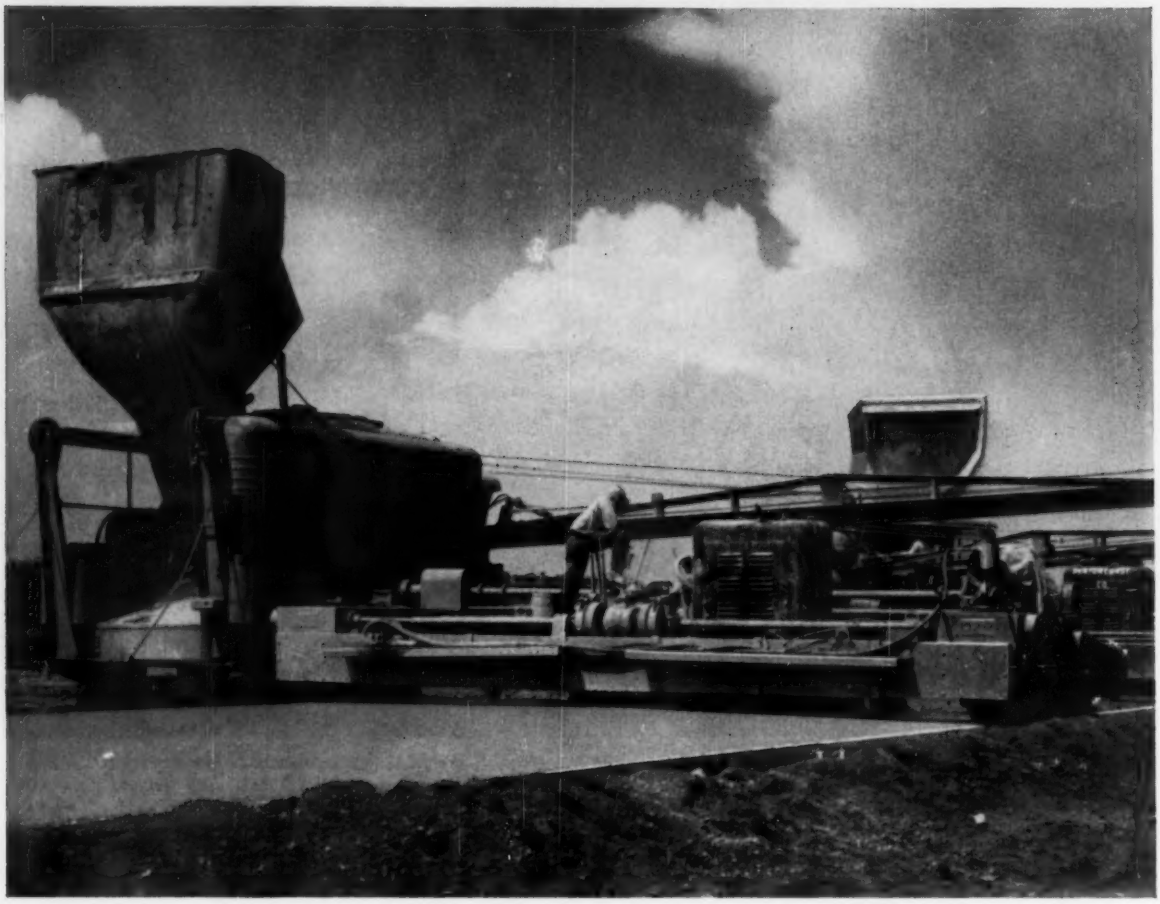

HARRISON-cooled Diesel power paves the way for new record of 6,029 feet of 9-inch concrete highway in 12½ hours

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editors notes...

You'll want to read about...

We talk shop this month with a father and son team of "Precision Engine Rebuilders", A. L. and Lawrence Torgis . . . and precision is the key to the Torgis operation in Toronto . . . pictures tell the story beginning on page 26 . . . .

With this Tool and Maintenance issue we kick off an exciting series of profiles . . . TODAY'S DIESEL MAN. Our industry revolves around him . . . read his story on page 30 . . . .

EMSA, an Equipment Maintenance Supervisors Association out in California . . . now in its fourth year and still growing, here is dramatic proof of what men can do by pooling know-how . . . could be the nucleus of a national organization of maintenance supervisors (Pg. 32)

Overhaul specialist teams from National Marine Service, mobile service men that move in, do a job and move out. It started with crews going aboard towboats and barges, but now they've come ashore and are doing a bang up job for the pipelines, contractors and power people . . . it's on page 34

Equipment for rod reconditioning and why this vital engine rebuilding operation is more important than ever . . . here's a rundown on some accurate, modern tools and procedures that can make this job easier for you (pg. 38)

You'll want to read about...

Where there's smoke there's fire . . . and atmospheric contamination by engine exhaust smoke is sparking some bad publicity for diesel . . . smokemeters can help fight this and do a maintenance job as well . . . this story could save you trouble, time and money, it's on page 43 . . . .

A battle report on the war against airborne dirt . . . modern developments in the field of air filtration are helping us win, but its a fight every engine owner gets into . . . clean air means less engine wear and here's a report on weapons you can use to save your engine (Pg. 46)

Selection and application of industrial hose gets a going over . . . if you aren't sure that you could make the right selection for a given application and then see it properly installed this will give you a guide . . . check page 51 . . . .

All of the big three are now in the diesel engine business . . . Chrysler Corporation adding .... diesel engines to its Marine and Industrial Engine Division line. Through an agreement with Klockner-Humboldt-Deutz, Deutz air-cooled diesels will now be available through the Chrysler industrial sales outlets (Pg. 54)

Since this is a maintenance issue we're done a little overhauling ourselves . . . reconditioned the layouts, refaced the display type and honed up the readability by moving some departments around. Then we ground down some pencils and went to work to pack this issue with fuel for thought. Now how about some comments on our new look . . . .

ESTABLISHED IN 1923
JULY, 1959 VOL. 37 NO. 7

diesel power

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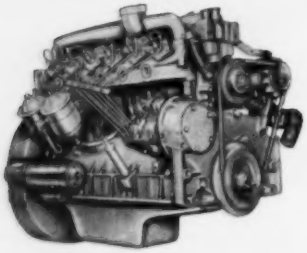

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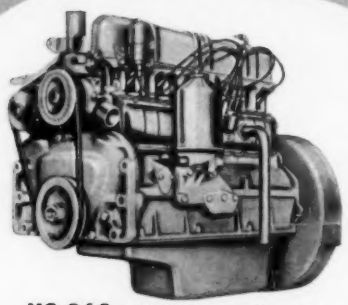
UD-282 DIESEL 95 Int. Eng. hp. Interchangeable with UC-263.

UC-221 CARBURETED 75 Max. Eng. hp. Interchangeable with UD-236.



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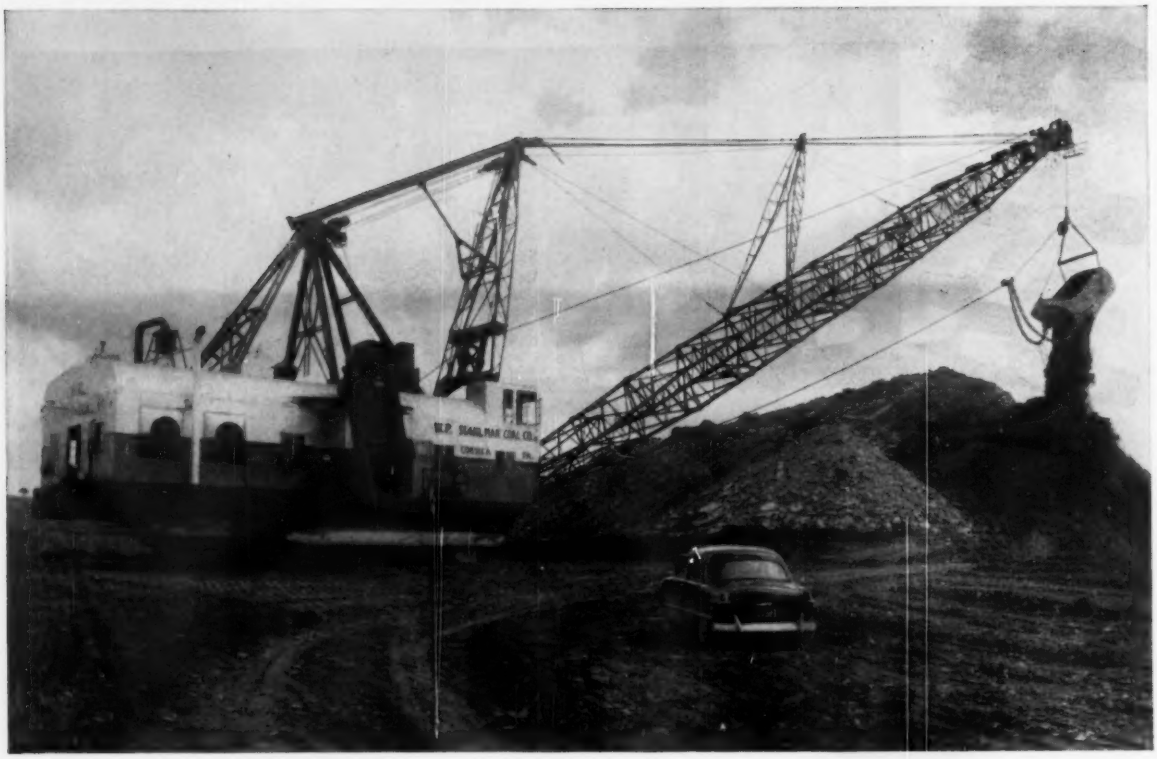

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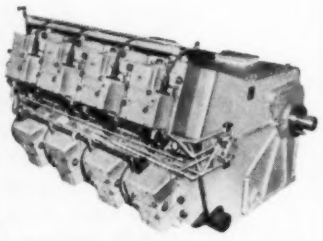

This Page close-coupled V-type horizontal 8-cylinder engine is equipped with Bendix Fuel Injection equipment. The dependability and economy of Bendix Fuel Injection systems are also being proved daily in such applications as locomotives, tugboats, towboats and petroleum pipelines. In remote spots like Thule, Greenland, where dependability is priceless, this equipment is on electric power generating engines.

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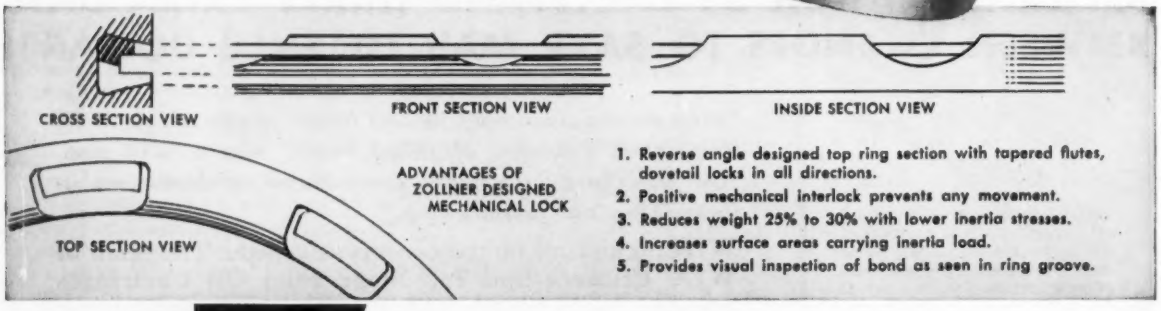

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diesel power editorially speaking

TODAY'S DIESEL MAN

A few years back, an eastern railroad got a new president who was out to make a showing. In paring costs, he cut back drastically on maintenance. The books looked great—for a while. Now he's out ruining another railroad while his successor is trying to climb from behind the eight-ball of rundown equipment. This shows that some learn the facts of life the hard way. But smart management already knows that the maintenance superintendent is one of the most important men on its team. Never before has he been so important. And this goes whether on the railroads, in construction and earthmoving, logging, mining, in the oil fields truck and bus operation and every other industry where diesels are the predominant form of power. Why? Simple—look at today's operating cost picture. There's not much you can do about equipment prices, financing charges and labor costs. It's possible that you can shave overhead a little. So where is opportunity for substantial saving to give you an edge on your competitor? Principally, in greater productivity and lower cost of operation and maintenance. Productivity is influenced by size, selection and utilization of equipment. But it also depends on having the equipment available—minimum downtime. So we are back to our maintenance superintendent. Here's the guy that's responsible for keeping the equipment on the line. And with responsibility goes authority—authority to get what he needs to get the job done. Who is better qualified to say what equipment, parts and supplies stand up the best and do the best job? So if you have a better widget, you have to sell him. Today's maintenance superintendent is a Diesel Man. He has to be; the diesel engine is the common denominator of all the industries mentioned. And he is growing in importance as a vital part of management's team. He's progressive and up-to-date (see the EMSA article in this issue). What's he like? There's a profile on one in this issue and there'll be more. You'll see why the maintenance superintendent should never be sold short—he's a key man worthy of the growing recognition and attention that he's getting from the entire diesel industry.

B. P. E.

ENGINEER'S FIELD REPORT

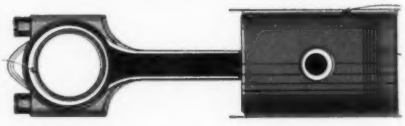
PRODUCT RPM DELO OIL RR

FIRM NORTHERN PACIFIC RAILWAY
South Tacoma, Wash.

RR diesel gears show only ½° wear in 2½ million miles

Timing gears on this Northern Pacific GMC-diesel locomotive engine, lubricated with RPM DELO Oil RR, recently completed 2½ million miles of severe freight service without repairs or adjustment. NP's South Tacoma Shop Foreman, A. R. Genin (above), indicates degree marks on engine flywheel, used to gauge gear wear. Tolerance between gear teeth shows variance of just ½° from original setting. Mr. Genin says, "We consider this low rate of wear remarkable for heavy-duty freight operation. It is typical of our experience during the 12 years we have used RPM DELO Oil in all our locomotive diesels." Engines are 1350 h.p. 16-567 series.

Why RPM DELO Oil RR reduces wear, corrosion



• Oil stays on engine parts—hot or cold, running or idle • Anti-oxidant resists lacquer formation • Detergent keeps parts clean • Special compounds prevent corrosion of bearing metals • Inhibitor resists foaming.

For More Information about RPM DELO Oils or other petroleum products of any kind, or the name and address of your nearest distributor, write or call any of the companies listed below.

LUBRICATING OILS RPM DELO

TRADEMARK "RPM DELO" AND DESIGN REG. U. S. PAT. OFF

STANDARD OIL COMPANY OF CALIFORNIA, San Francisco 20

THE CALIFORNIA OIL COMPANY, Perth Amboy, New Jersey

STANDARD OIL COMPANY OF TEXAS, El Paso

THE CALIFORNIA COMPANY, Denver 1, Colorado

diesel power news section highlights

PIGGY-BACKING PIONEERED BY LONG ISLAND RAILROAD

Back in 1885 the railroad reports that farmers ran wagons loaded with produce for markets in Brooklyn and New York on special flat cars. Horses rode in box cars and a coach was provided for grooms and drivers.

Operation was practical, more so now but not complicated by "self interest" groups jockeying for power.

PIE WINS COVETED PRESIDENT'S TROPHY

Pacific Mountain Express has won the President's Trophy, recognition of a carrier's overall contribution to safety on the highway. Award is made by the 1958 National Truck Safety Contest. In his announcement of the award, PIE's Director of Safety and Driving, K. N. Beadle, praised company's 1800 drivers and men responsible for safe maintenance of vehicles.

DODGE DIESEL DUE THIS FALL

Dodge trucks for 1960 will be available with choice of four Cummins engines, the NH-220, C-175, NH-180 and NH-195. Dodge showed first tandem tractor powered by the NH-220 at Tulsa IPE.

New diesel trucks will range from 27,000 to 53,000 lb gvw with gcw's from 50,000 to 76,800 lbs.

LOS ANGELES GETS SIX DIESEL TAXIS

Yellow Cab Co. has six diesel cabs in service to test public reaction. Taxi patrons received postcards on which to write their comments on the diesel cabs. According to the firm, if public accepts new taxis, it will gradually replace 1000 gasoline-fueled cabs with diesels.

Company also stated that move would help reduce smog, since diesels produce fewer smog-forming after products than gasoline engines.

RELATED INDUSTRIES MOVE TO SUPPORT THREATENED FEDERAL HIGHWAY PROGRAM

Federal highway program is threatened by lack of funds. Slow down now will mean increased costs to public in the future. Unless program continues on a regular basis, "peak and valley" construction is natural result. Continuity of program is important to maintenance of low costs. Contractors will have to bid higher after idle periods.

Association of General Contractors of America has announced its support of measure proposed by Congressman Fallon which is intended to continue the accelerated federal-aid highway plan.

American Trucking Association has come out in favor of borrowing to keep vast construction program going. System would use repayable advances, or revenue bonds secured by trust fund receipts. ATA maintains this would keep highway trust fund in sound financial position.

What does it all mean to our industry? More work for more contractors . . . expansion of the trucking industry . . . better highway facilities for all.

MORE NEWS HIGHLIGHTS FOLLOW ►

NEWS SECTION HIGHLIGHTS . . .

"RED TIGER" POWERS FORD'S NEW DIESEL TRACTOR

A new diesel tractor in the 601-701 power series has been announced by Ford. Tagged as lowest priced diesel tractors in their class, they join 801-901 series introduced last year. New tractor is powered by a new 144-cu in. "Red Tiger" diesel.

Another new diesel unit from Ford is the Fordson Power Major which succeeds the Fordson Major Diesel. Ford is stressing diesel economy all the way . . .

AED "INDUSTRY ROUNDTABLE" MEET TO BENEFIT USER

Twenty-five leading distributors and manufacturers, members of the Associated Equipment Distributor's "Industry Roundtable" held a one-day meeting in Chicago recently.

High on the agenda were discussions of marketing, sales procedures and service. Highlight of conference were talks on 10 key questions on distributor-manufacturer cooperation for improvement in service to the user of construction machinery.

FPC AUTHORIZES INSTALLATION OF COLUMBIA GULF REMOTE STATION

FPC has given green light to Columbia Gulf Transmission Company's remote-controlled compressor station at Hampshire, Tenn.

Clark 4000-hp 2-cyl turbocharged vertical gas engine driving a centrifugal compressor through a speed-increaser will be remotely controlled from Columbia Gulf's gas control center at Nashville.

Natural gas industry will be watching this unique operation, one eye cocked at vital cost figures.

OPERATION DIESELIZATION

Increase in number of diesel tractors including both wheel and track-type continues. Here are the figures from the U. S. Department of Commerce - another case of diesels doing the job, economically, reliably.

26.3% OF FARM TRACTORS PRODUCED IN 1958 WERE DIESEL

TOTAL	GASOLINE	DIESEL	LPG
265,500	183,419	69,716	12,365
100%	69%	26.3%	4.7%

32.8% PRODUCED IN FIRST QUARTER 1959 WERE DIESEL

TOTAL	GASOLINE	DIESEL	LPG
75,985	47,288	24,930	3,767
100%	62.3%	32.8%	4.9%

AND IN MARCH OF 1959 ALONE IT WAS 34.2%

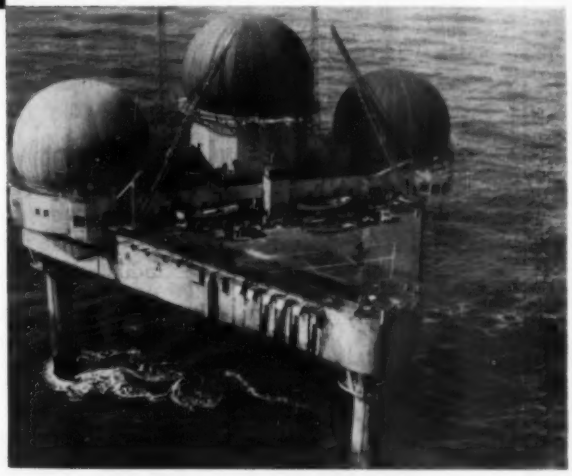
TOTAL	GASOLINE	DIESEL	LPG
28,524	17,916	9,835	973
100%	62.2%	34%	3.8%

MORE INDUSTRY NEWS FOLLOWS ►

diesel power news section

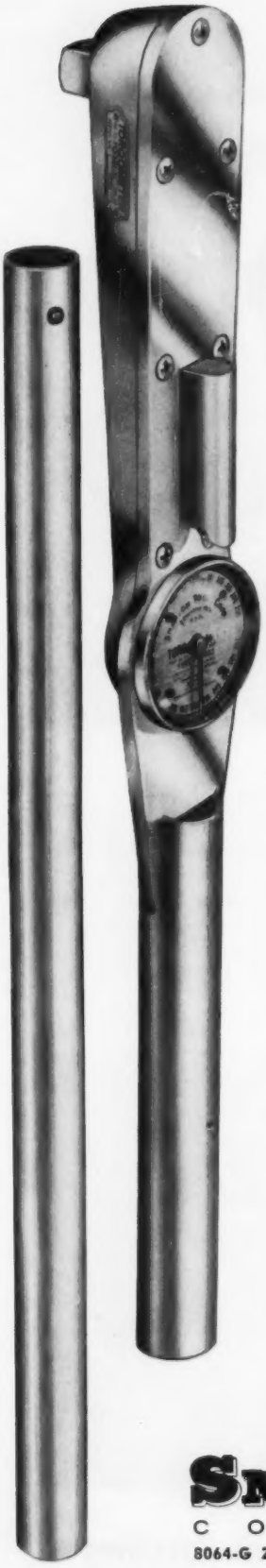
International Superior TD-14 sideboom positions 50-ft section of the 650-mile system being built for North Carolina Natural Gas Corp. in northeastern sector of North Carolina. H. L. Gentry Construction Co. is completing 222 miles of the project. Two crews, using 8 International Superior sideboom and dozer-tractors, 16 International crawlers and 3 International power-units, lay from 1 to 1½ miles of pipe in rough swampy country. System will tie into a 22-town distribution program for this area.

107 years of service is the combined length of employment of these two men. Mr. Emil H. Lang on the right, Chairman of the Board of Directors of Erie Forge & Steel Corporation, presents a fifty-year service award to Chief Operating Engineer Edward Weber. Mr. Lang started with the firm, one of the oldest crankshaft forgers in the industry, in 1902 giving him 57 years of service. Mr. Weber began as a laborer in 1909.



Diesel-generator power supply at U. S. first North Atlantic offshore radar station was threatened by an attack of "acute salt water chemistry". Galvanic corrosion of the copper-nickel alloy piping used in the salt water cooling system for the diesels was the invader. Rigid unplasticized polyvinyl chloride (UPVC) pipe and fittings were installed. UPVC does not cause electrolytic action, is impervious to salt water corrosion and will probably outlast Texas Tower No. 2's useful life. UPVC pipe, fittings and flanges were injection molded by Tube Turns Plastics, Inc.

NEWS ABOUT PLACES, PEOPLE AND PLANTS FOLLOWS ►



torquing by "feel" can ruin equipment

BE RIGHT

with a Snap-on torqometer®

With a SNAP-ON TORQOMETER, you can take the gamble out of diesel repair and every job where bolt tensions are specified. Any maintenance man can hit specifications every time — help eliminate faulty operations and undue wear of moving parts caused by mechanical distortion. With the dial of the TORQOMETER adjusted to the required torque, tighten the bolt, nut or stud until the pointer reaches zero—or, on light-indicating models, until the light flashes.

All TORQOMETERS are balanced for easy use in any position. Readings are consistent and accurate no matter where wrench is held or how much leverage is applied.

SNAP-ON builds TORQOMETER models from 0-3 in-lb to 0-4000 ft-lb. Their slim design lets you use them in tight places. Ratchet adaptors are available to do jobs where handle movement is limited.

A SNAP-ON Sales Engineer can give you more facts on the value of TORQOMETERS in your production or maintenance operations. A SNAP-ON Branch Office is located in every major U. S. industrial center.

Write, wire or phone for catalog listing the complete series plus full range of wrenches and hand tools.

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CORPORATION
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NEWS SECTION . . .

Pick-Up in Construction Machinery and Equipment Production

Second quarter of 1959 shows an increase in the production of construction equipment and machinery. Manufacturers expect this increase to gain throughout the remainder of the year. It is predicted that 1959 will be the second largest production year for the industry in terms of dollars. Estimates on production for 1959 run $2.2 billion. 1958 total was $1.9 billion and biggest year so far was 1956 when total ran $2.4 billion.

Railroad Carloadings, Expenditures Up

Freight business, for those lines going after it, is good. Santa Fe Railway figures for the first quarter of 1959 show net of $12.1 million as compared to $7.3 million in the same period of 1958. This, and other interesting facts related to the diesel industry were reported by Santa Fe's president, Ernest S. Marsh at the 64th annual stockholders meeting.

Increased carloadings mean more equipment. Indicative are the road's gross capital expenditures for 1959, which shape up to be about $55 million as compared with $35 million in 1958. Marsh mentioned specifically appropriation of funds covering a program for 69 new diesel units and 2431 new cars.

Robert Bosch Nozzle Sales Campaign Launched

In response to increased original equipment use of Robert Bosch injection units by engine manufacturers, and the need for stocks and information to be in the hands of dealers, the Robert Bosch Corporation has developed a special injection nozzle kit. This kit contains a catalog covering applications, cross-references, service tool information, service instructions, information and prices, a sign and a single metal-drawer cabinet to hold and protect parts. The kit is given free to dealers who have selected and purchased stock to fit their needs.

Cummins Delivers One Millionth "V" Horsepower

Built into a VT-12 Turbodiesel powering a Michigan tractor-dozer, is the one millionth "V" horsepower from the Cummins Engine Co. It is part of 600-horsepower engine produces to drive the push-loader delivered to M.M. Sundt Construction Company of Tucson, Arizona.

Big dozer went into service, 15 miles east of Tucson where Sundt has a million dollar contract with the Arizona Highway Department to build 5.3 miles of two-lane highway. Project requires the moving of more than 700,000 tons of material.

Taking part in the delivery of the Cummins-powered Michigan were C. J. Wilhite, Manager of Construction Sales for Cummins Engine Company, John S. Sundt, President of M. M. Sundt Construction Company and Paul O. Miller, President of Cummins Arizona Diesel.

Change in Percentage Depletion Deduction Threatened

Percentage depletion is a tax deduction granted producers of petroleum, and other natural resources, to compensate for the exhaustion of their raw materials. Rate is now 27.5% for oil producers. This is limited to 50% of net income from any producing property, cuts the average depletion allowed. In 1957 it worked out to about 23%.

Congress is now studying proposals to cut the rate to 15%. Drillers now hard pressed to balance expenditure and revenues, would face three prospects: raise prices; sell out; exhaust present reserves without replacement.

Take the incentive for future expansion, continued development out of business and what's left? Oil producers would be forced to use existing reserves, cut way back on exploration and testing. Odds against finding oil now are 8 to 1.

Any changes in percentage depletion laws should be approached with extreme caution. Bills before Congress now, if enacted, could mean money out of *your* pocket! What can you do—write your congressman and let him know how you feel.

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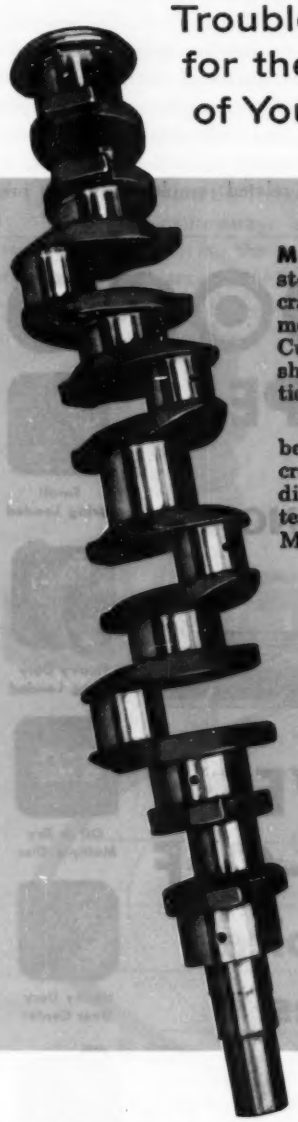
Factory-Certified Exchange Crankshafts give Trouble-Free Operation for the Full Life Cycle of Your Diesel Engine



Morco dealers — coast to coast — are stocked with reconditioned, like-new crankshafts for different diesel engine models. Users of Detroit Diesel and Cummins engines can exchange worn shafts for MORCO factory-reconditioned shafts through authorized dealers.

Why take chances? Let your dealer be your source for dependable, safe crankshaft regrinding. You get immediate service, guaranteed quality and terrific economy. Ask your dealer about MORCO today.

Look what Morco's complete reconditioning service offers you!

- **Magnaflux**—six separate magnaflux inspections with latest equipment.
- **Ground** on production type equipment to engine manufacturer's specifications. Original stroke retained.
- **TOCCO*** **Induction Hardened** by the original equipment method when necessary.
- **Rolled Fillets** increase strength at the most critical areas.
- **Dynamic Balance** restored on original factory balancing equipment.
- **Thrust Collars** and surfaces repaired.
- **Gear Fits** renewed.
- **Key Ways** restored.
- **Dowel Holes** repaired.
- **Oil Seal** surfaces renewed.
- **Threads** repaired.

*TOCCO is a registered trademark of The Ohio Crankshaft Co.

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Bedford, Ohio

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NEWS SECTION . . .

Cummins-Approved ITS Courses

International Training Services, Portland, Ore. has just announced two Cummins-approved home training courses in diesel. Cummins has authorized ITS to provide these courses for Cummins diesel mechanics and employees as well as for some non-employees. The first course covers "Principles, Maintenance and Repairs", the second covering "Cummins Engine Unit Rebuilding." Cummins has announced that a qualified graduate who completes both courses is eligible for one weeks tuition-free training at the Factory Farming Center in Columbus, Indiana.

In addition to Cummins personnel, these courses are open to fleet users, ITS graduates of the general diesel and heavy equipment training program and individuals with at least two years of mechanical experience or diesel-related employment. A prerequisite to enrollment in the second course is completion of the first.

Here's a practical answer to the chronic mechanic problem that is widely reported. It is also somewhat of a "breakthrough" in the area of dissemination of diesel service information. Cummins has indicated that courses will be reviewed and kept up to date.

Cummins, ITS and users are bound to benefit. Other engine builders should think this one over.

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OIL FIELD TYPE

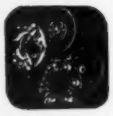
Heavy-Duty

LONG LIFE

POWER TAKE-OFF

➡ Provides a Choice of Clutch Types

ROCKFORD Oil Field type POWER TAKE-OFFS are furnished with single or double plate, gear tooth drive clutches—with organic or Morlife® cerametalic friction material. A single plate Morlife clutch provides the torque capacity of a double plate organic lined clutch. Morlife's 400% longer life and 50% better heat disbursal also increase the efficiency of oil field equipment.



Small Spring Loaded

Heavy Duty Spring Loaded

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Power Take-Offs

Speed Reducers

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Gives dimensions, capacity tables and complete specifications. Suggests typical applications.

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Export Sales Borg-Warner International — 36 So. Wabash, Chicago 3, Ill.

CLUTCHES

AiResearch Dual-Purpose Shop Reconstruction Program

Economy and improvement in already high quality of AiResearch turbochargers were the aims of an extensive shop reconstruction program at Garrett Corporation's AiResearch Industrial Division.

Work included a large specially partitioned area where rigid control of air cleanliness throughout the assembly process is maintained.

Parts are skidded into "clean" area through doors which seal when closed. Skids go through new solvent cleaning process as well, lessening chances of dirt entry.

Entire procedure is planned to minimize product handling from cleaning through packing and shipping.

Further construction is providing additional engineering space.

Hamilton Diesel-Electric Units to Power U. S. Navy Radio Station

Diesel generating equipment will power what is believed to be the most powerful radio station of its kind in the world. Hamilton Division of Baldwin-Lima-Hamilton has been awarded a $2,098,911 contract including engines, generators and complete auxiliaries for the Navy very-low-frequency transmitting station now under construction near Cutler, Me. Contract calls for six engines. Four 8-cylinder rated 3870-hp at 257 rpm will drive generators producing 2750 kilowatts each. Two 6-cylinder engines each rated at 715 hp at 600 rpm, will drive 500-kw generators. Total horsepower of all engines will be 16,910 and total electric output of all generators will be 12,000 kw.

Foreign Shipowners Go for Diesels

More than 50 Norwegian shipowners recently visited the diesel engine plant of MAN Augsburg. While interested in improvements in plant facilities, their major interest was in MAN's high-output, 2-cycle diesels. In this case they saw the acceptance tests of a 6-cyl marine diesel, type K6Z78/155.

This supercharged engine is rated 8100 hp at 115 rpm or 35% more than the naturally-aspirated model. It showed capability of 9000 hp with a clean exhaust, indicating substantial reserve capacity. This shows that MAN's port-scavenging system is as suitable for super-charging as the uniflow system. During tests the specific fuel consumption was 0.326 lb per hp hr, corresponding to a thermal efficiency of 42.7%. MAN attributes this to their special charging process that eliminates auxiliary pumps of under-piston air pumping.

Illustrations and parts of MAN's 840 by 1600-mm engine were also seen. A 3-cyl version of this engine will be tested in a few months. The 12-cyl model will develop 20,000 hp. Some engines have been ordered through MAN licensees.

Also seen were two type K12Z57/80 engines rated 7800 hp each at 225 rpm. These are for the new Dutch ferry "Zeeland" to run between Holland and England.

Controlled Torque Settings At White Motor Plant

White's quality control program on bolting operations at its truck and bus manufacturing plant points up importance of torque settings.

Thousands of bolts and fasteners that go into manufacture and assembly of truck motor and chassis are as important to the performance of the final product as major components.

White's program began with a study of all connections made in the trucks. Torque standards were developed for each type of bolt and screw used, depending on application.

A Skidmore-Wilhelm torque wrench calibrator is used to test accuracy of assembly line torque wrenches.

With standards established as a guide, torque wrenches used and their accuracy maintained, high quality control of all components and finished assemblies of trucks and buses is possible.

Self-Guided Highway Buses Offered as Transit Solution

W. J. McCarter, General Manager of the Chicago Transit Authority, Chicago suggested self-guided bus trains to operate within the rights-of-way of multilane expressways as a possible means of solving the public transit problem of large cities. Diesel power may play an important part in such a system.

Still in the study stage, the proposal has some precedent in that industry is now using small rubber-tired self-guided motorized trucks for intra-plant parts pickup and delivery.

Advantages would be low construction costs, low operating noise levels and the lack of above-ground structures.

Public transportation in heavily populated areas is fast becoming a major problem. Some kind of action must be taken soon.

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FUEL INJECTION
EQUIPMENT
for Diesel Engines
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Joseph Lucas (Canada) Ltd., Head Office: 11 Davies Avenue, Toronto 8, Ontario
Branch Office: 3401 St. Antoine Street, Montreal 30, Quebec
AP929

NEWS SECTION . . .

Diesel Land-Rover Available

British built 4-wheel-drive Land-Rover is now available with a Rover diesel. Newly introduced 88-in. wheelbase station wagon model can be equipped with a Rover diesel for $350 over the gasoline engine model's price of $3160.

Rover diesel is 4-cyl., 52 bhp engine with wet liners. Important design goal was maximum parts interchangability with the gasoline engine.

Manufactured by The Rover Company, Land-Rover is known for its reliability, rugged construction and versatility.

Moss Trucking Relocates Historic Fire Engines

A five-day-long convoy of twelve truckloads of historic fire equipment made the trip from Hialeah, Florida to Blowing Rock, N. C. Moss Trucking Co., already credited with being one of the only trucking firms ever to move an entire railroad, completed the unique job.

Eight of the big flat-bed trailers made the trip straight through while four others made stops along the line for the benefit of residents. Some 35 pieces of rare fire-fighting equipment are now installed in the new museum site at Blowing Rock.

New Service Training Center for Hercules

E. L. Latta, director of service engineering at Hercules Motors Corp., has announced the opening of a new service training center at its headquarters in Canton, Ohio. A six-month series of regularly scheduled training courses for distributor and dealer personnel has been inaugurated. The program of conference-type training courses will cover basic fundamentals of design, servicing and maintenance of all Hercules products.

Davidson Adds Diesels

Davidson Transfer and Storage Co. of Baltimore has added 10 Cummins-powered White tractors to its fleet. This short-haul carrier now has 20 units powered by Cummins JT-6-B Turbodiesels. The firm does an outstanding business in household good moving, also offers a variety of services as a general commodities carrier. Davidson has been a constant winner in national safety contests since 1949.

Cummins Powered Kenworth K-521's for Younger Bros.

Younger Bros. Inc. of Houston, Texas has taken delivery of 24 new cab-over-engine Model K-521 Kenworth trucks powered by Cummins NH-195 diesel engines.

Trucks will be used in Texas and Louisiana to transport liquid petroleum products and petro-chemicals.

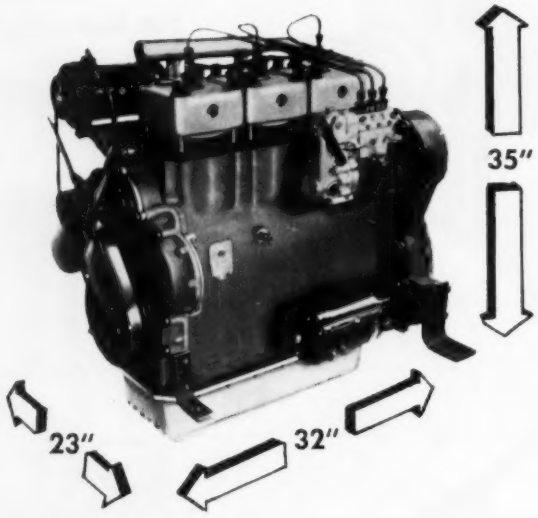
Younger operates in 29 states, primarily in oilfield construction and oilfield hauling and highway transportation of petroleum products.

New Kenworth tractors joining Younger fleet feature 73-in. all aluminum tilt cabs, aluminum frames, wheels, hubs, fuel tanks and brackets.

CERLIST DIESEL

MODEL 3

AUTOMOTIVE • INDUSTRIAL • MARINE



● WEIGHT 600 LBS.

● 85 HP AT 3000 RPM

● 75 HP AT 2800 RPM

● 65 HP AT 2600 RPM

Cerlist Diesel, INC.
BURLINGTON, NORTH CAROLINA

PRODUCERS OF LIGHT WEIGHT, HIGH SPEED DIESEL ENGINES

Bearings...

Oil... and How to Save Money

The longer your Diesel runs before need of overhaul—the less your cost of operation. Sinclair Gascon® Oils have earned the reputation not only for giving long bearing life, but also for resisting the formation of harmful carbon deposits. Gascon Oils slash down-time and maintenance costs. Next time management asks how you've cut costs, tell them you've switched to Sinclair Gascon—and show them the results.

Call your Sinclair Representative for further information or write for free literature to Sinclair Refining Company, Technical Service Division, 600 Fifth Avenue, New York 20, N. Y. There's no obligation.

Sinclair

Sinclair
Gascon® Oils

diesel power news section people plants

Pennington Channelcromium Sold to Electro-Coatings

Pennington Channelcromium Co. of San Antonio, Texas has been acquired by Electro-Coatings, Inc., midwest plater and manufacturer.

Acquisition gives Electro-Coatings a total of seven plants located in Chicago, Shiller Park, Moline, all in Ill., Milwaukee, Wisconsin and Cedar Rapids, Iowa.

New owner reports that Channelcromium process for plating diesel engine liners and aircraft cylinders will be continued. It has been approved by the government, Air Force, Navy BuAer and Buships and is well accepted in the commercial field.

Service will be extended throughout the U. S. and Mexico by Electro-Coatings flying sales representatives and its strategically located plants.

Humphrey New Director of Sales for Hercules Motors

William F. Humphrey, midwest district sales manager for Hercules Motors Corporation has been promoted to director of sales.

Mr. Humphrey has been with the firm since 1940 serving as branch manager in Salem, Ill., Kilgore, Texas; Houston and Los Angeles. He has also served as manager of West Coast Retail sales, manager of oilfield sales and mid-west district sales manager.

Robert W. Kerr

Frank H. Cankar

Top Level Changes at Fairbanks, Morse & Co.

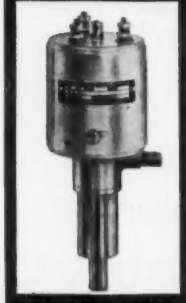
Newly elected president of Fairbanks-Morse is Robert W. Kerr. Mr. Kerr takes over from Robert H. Morse, Jr., who is named Vice Chairman of the Board.

Elected to the newly created post of Vice President-Administration, is Frank H. Cankar. William S. Schwab, Chicago attorney, and Delmar W. Holloman, Washington, D. C. attorney were elected assistant secretaries of the company.

Mr. Kerr is also Vice President in

SPEED SENSITIVE SWITCH GOVERNORS

Adjustable within a speed range while running



1 Switch UNDERSPEED OR OVERSPEED

2 Switches UNDERSPEED AND OVERSPEED

3 Switches UNDERSPEED, INTERMEDIATE AND OVERSPEED

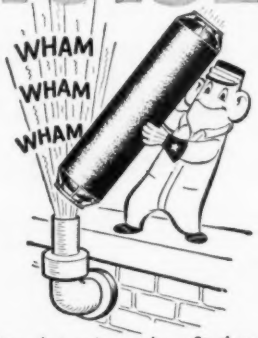
All "STANDARD" Speed Sensitive Switches can be furnished to TRIP at any speed between 500 and 6000 RPM. On special order higher or lower speed operation can be supplied. Also special body styles, mounting pads, drives, terminal connectors and caps are available.

Write for Bulletin 504 for further information

SYNCHRO-START PRODUCTS
Since 1932
8151 NORTH RIDGEWAY AVENUE • SKOKIE, ILLINOIS

STOP THAT NOISE!

from Air, Steam and other gas discharges with BURGESS-MANNING SNUBBERS



Stop that noise and profit through better neighbor and employee relations. Avoid compensation claims.

Burgess-Manning Snubbers are engineered to effectively correct your specific noise problem.

From a WHAM

BURGESS-MANNING COMPANY
Sound Engineering
Industrial Silencer Division
9209 Sovereign Row, Dallas 35, Texas
Libertyville, Illinois

charge of subsidiary operations for Fairbanks Whitney. Prior to this he had served for 5 years as Vice President and Group Executive of the American Machine and Foundry Co.

Changes at EMD

Reflecting the expanding activity of Electro-Motive in the electric utility field, a series of organizational and personnel changes have been announced.

R. B. Johnstone, former Eastern Regional Sales Engineer has been promoted to Manager, Utility Equipment Sales.

J. P. Greenip, former Regional Sales Engineer in the St. Louis region, has been transferred and promoted to District Manager—Utility District.

J. G. Cronin and M. C. Warren, former District Sales Managers, are now District Managers—Utility District.

In the Chicago region, F. E. von Ohlen, former District Sales Manager, has been promoted to Manager, Utility Equipment Sales. H. E. Mann, former Regional Sales Engineer, and D. R. Eichler, former Industrial Sales Engineer, are promoted to District Managers—Utility District.

Perkins Licensed to Manufacture and Sell Solar Gas Turbine Engines Abroad

F. Perkins Ltd. has formed a new sales subsidiary, Perkins Gas Turbine Ltd. with exclusive license to sell Solar gas turbines in Europe, Africa and the British Commonwealth with the exception of Canada.

Perkins is already manufacturing Solar 50-hp Mars gas turbines and has plans to begin manufacture of the Solar 70-hp Titan and 170-hp T-150 gas turbine during the coming year.

Agreement gives Perkins the rights to sell, in the specified area, all gas turbines designed and manufactured by Solar.

Victor M. Cain

Cain Elected President at Snap-On, 1958 Firm's Best Sales Year

Victor M. Cain was elected President and Chief Executive Officer of Snap-On Tools Corporation. He replaces Joseph Johnson, president of Snap-On for the past 20 years and co-founder of the firm. Mr. Johnson was elected to the newly created office of Chairman of the Board of Directors.

Sales for 1958 hit an all-time consolidated dollar volume record of $24,760,676, up almost half a million dollars over 1957.

KIENE® diesel engine test equipment

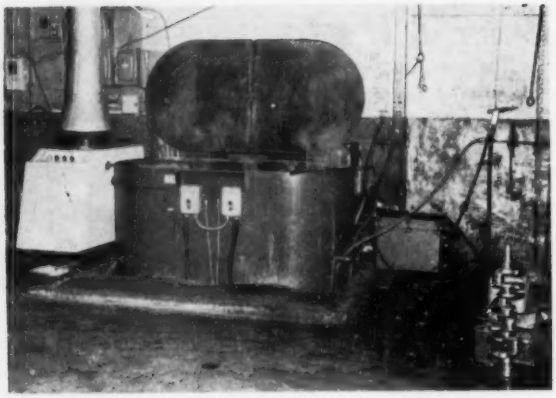
1. Model KTP-50, Hydraulic Test Pump . . . designed for field service . . . portable . . . no bolts or clamps for leverage . . . many novel features.
2. Model K-120, Universal Indicator . . . for high-speed automotive type diesels...can be adapted to larger engines for firing pressure readings.
3. Model V-10, Indicator Valve . . . rugged . . . will not blow open . . . adaptions for all locomotives.
4. Model K-100, Cylinder Pressure Indicator . . . simple . . . accurate . . . for compression and firing pressures on large horsepower engines.
5. Model UTS-10, Portable, Universal Unit Injector Test Stand . . . checks all sizes in one fixture.

Kiene Adapters and Connectors available for all makes and models of diesel engines manufactured in U.S.A.

Kiene Diesel Engine Test Instruments are recognized throughout the industry for their accuracy and adaptability. They are designed for long service under most severe field conditions. Kiene equipment assures the proper maintenance of diesel engines . . . helps prevent costly down time. Get the facts on Kiene before you invest in diesel test equipment.

Send for Descriptive Literature

KIENE DIESEL ACCESSORIES, INC.
BOX 216, FRANKLIN PARK, ILLINOIS



"Cleaning is important. The floor drain area is at the right of the Storm-Vulcan hot-soak tank. Hoses from the steam generator run behind the tank. All engines and parts get a preliminary steam cleaning before going into the hot tank. We find that the Canadian Permag Product's No. 318 compound does a good cleaning and descaling job. We had to add this settling-type filter at the right of the tank to keep the cleaning compound from loading up in a short time."

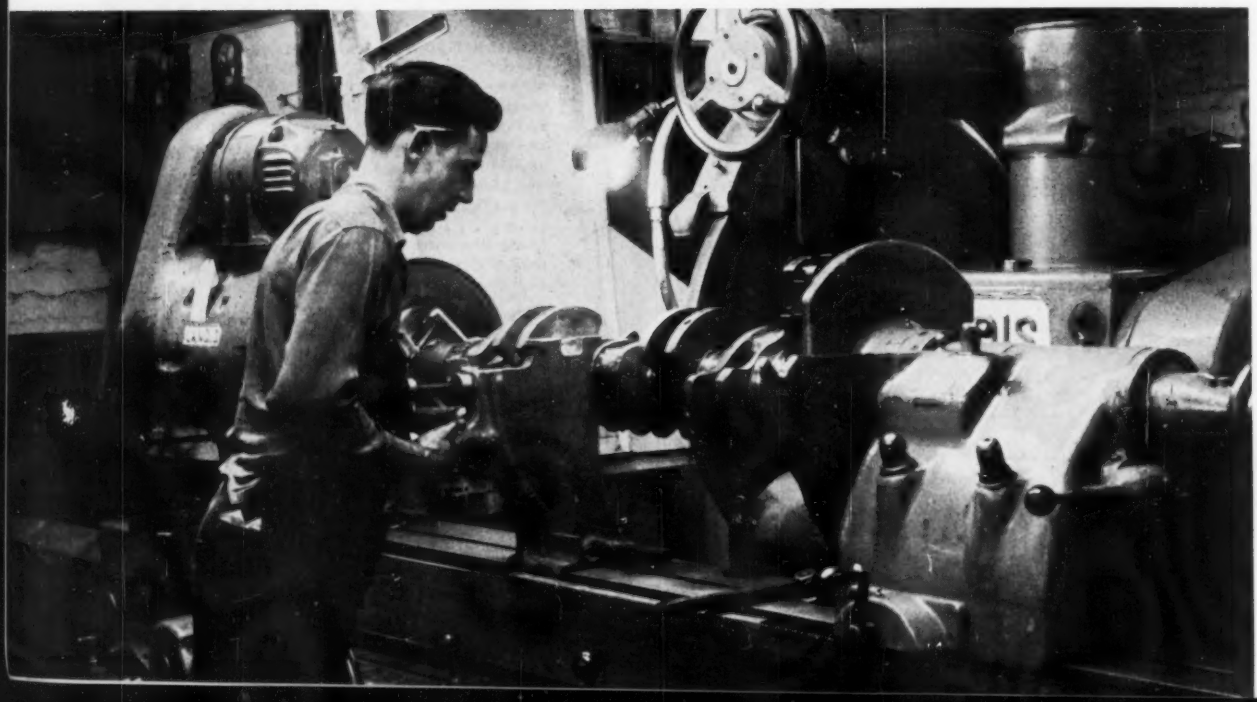
Talking Shops...

"Blocks and heads are hydrostatically tested for cracks. Walter Maniarski handles this work. He also does a good job with the cleaning and disassembly. You can see a few of the variety of blanking plates for different engine makes."

ON the letter head of A. L. Torgis & Son, Ltd. of Toronto are the words "Precision Engine Rebuilders". The shop has an excellent reputation among engine rebuilders not only for the quality of its work but for its progressiveness and sound techniques.

Any shop reflects the thinking of the top man. So we talked to Mr. Torgis. Place—the Royal York Hotel. Time—the recent Automotive Engine Rebuilders Association Convention. Later, we talked to his son, Lawrence, at the main shop.

Mr. Torgis was busy as head of the Toronto Convention Committee. This in itself was indicative. In his long and active participation in the AERA, he has gone through the whole range of official positions, is a past-president, and is now a member



of the Advisory Board.

This takes work but Mr. Torgis contended that you get in proportion to what you give to such organizations. Conventions and the contacts made at them, plus technical services rendered by the association, make it possible to keep on top of all industry developments.

He further contended that there is no better way to keep so well informed. There's dollar value in getting out and seeing what the other fellow is doing.

Those men who begrudge the time and money to attend and participate in their industry's associations please take note.

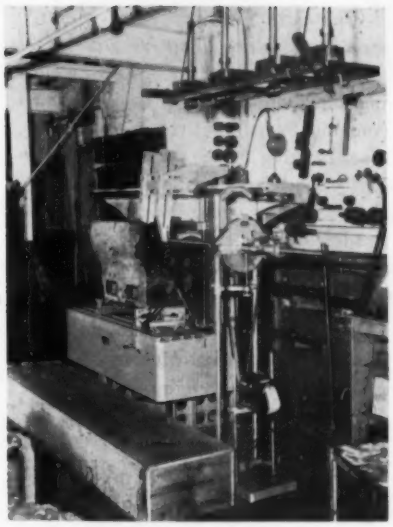
Next was a visit to the shop with Mr. Lawrence Torgis. Pictures and captions tell much of the story, the remainder is in the text.

"Tell me something about your operation."

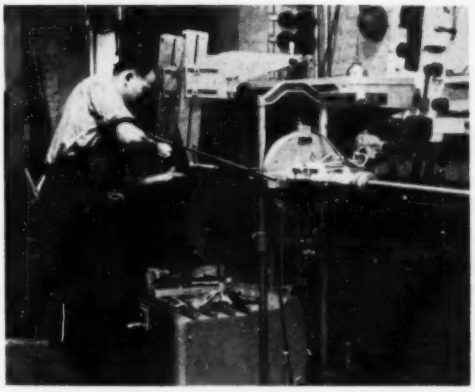
"This is our main shop and we have a branch at Mimco about 8 or 10 miles west of here. Engine rebuilding is done here. We also handle several lines of garage supplies and specialty items, but you're mainly interested now in engine rebuilding.

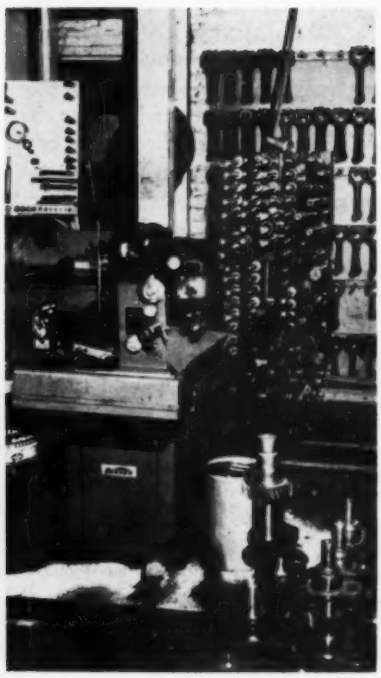
"Numerically, most of our rebuilds are gasoline engines. But we do a substantial amount of diesel work as well. For example, we do rebuilding of Cummins, GM 71's, International Harvester and Mack engines. We are also the authorized crankshaft regrinder for the Canadian distributor of Cummins diesels, Russel-Hipwell. We get shafts from all over Canada.

(*Continued on page* 28)



"Accurate line boring of bearing saddles and camshaft bearings is vital for a good rebuild. Casey Tokitsu does a fine job with the Tobin-Arp machine. Earlier we used the bar hanger setup suspended up there. We counterbalanced it to keep it out of the way yet quickly available."





"Many shop jobs, including some rod reconditioning, calls for honing. We have a Sunnen machine and a range of madrels and stones from 3/9-in. up to 3-in. We don't know how we'd get along without the machine's capability to produce fine finish and accurate bores. George Nishimura, for example, is honing a brake master cylinder. The gauge above the spindle provides accurate internal measurement."

"Our crankshaft grinding is done on one of three machines. Most diesel shafts are done on the big Landis grinder. Charles Emmerson is grinding one now. Shafts are straightened if necessary. Throws are always ground first to relieve stress. Then our own fixtures hold the shaft so that mains are done on dead center. Throws are checked again. Wheels are dressed to the proper radius and fillets are carefully reproduced. Polishing is the final step. One feature of this grinder is that you don't need a gauge to continually check the diameter. The wheel slide is set to produce the proper journal diameter. We just mike them as a check."

"In addition to complete rebuilds we offer machine shop services such as rod reconditioning, head grinding and rebuilding, and similar work common to automotive shops of our type. Backing up the specialized tooling we have a general machine shop. For example, over there we are straddle-milling the top end of Cummins rods so that they accept a new type piston.

"Actually, we're set up to do a complete rebuild on high-speed diesels and gasoline engines or recondition any of their components. One exception is fuel injection work. We have this done in a specialized shop."

"Are there any particular differences between your operation in Canada and a rebuilding shop in the United States?"

"Not really. Probably the biggest difference is that we don't have as many diesels here. You'll notice that we use much the same tooling and even the names on the garage items we stock are familiar. Some are made in Canadian plants and others are imported and distributed here."

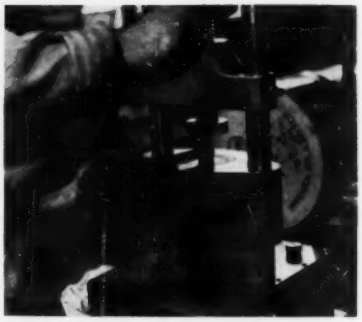
"About the volume of diesels, you'd think they would be popular here."

"We are getting more and more but the problem is service once you get away from the bigger cities. One trucker has a Leyland engine he brings in. He likes the truck's performance and economy but hesitates to get more. Some areas he covers have no facilities for diesel repairs but he can always get a gasoline truck patched up."

"That's something for the diesel builder to note. No service, no sales. Now, suppose I were a customer and you were trying to get my engine rebuilding into your shop. What would you stress?"

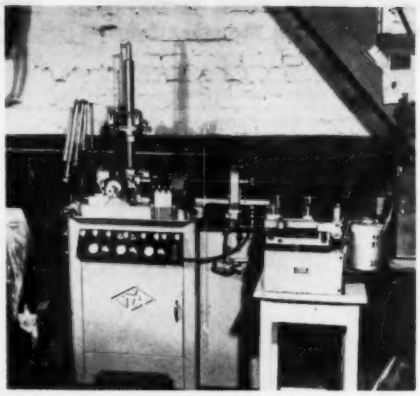
"Service and accuracy. We have established a policy of giving the best possible service and our people are very conscientious in carrying it out. Accuracy results from three things—

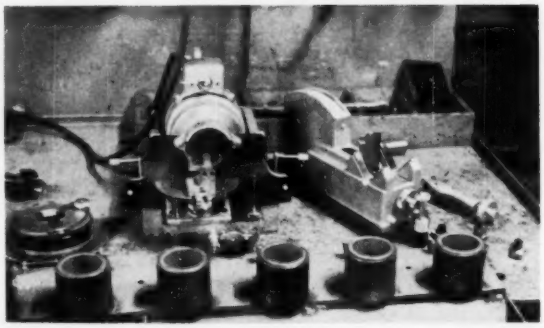
(*Continued on page 74*)

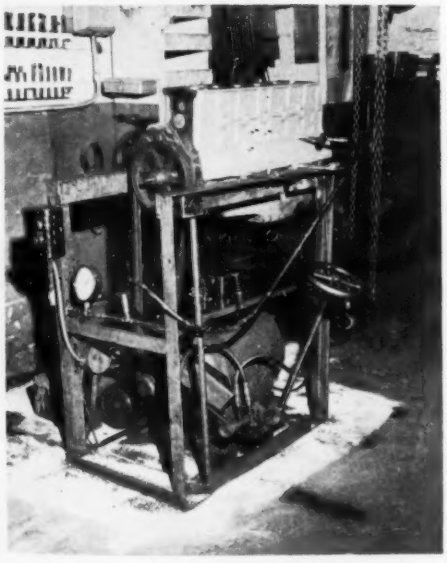


"Rod reconditioning and pin fitting are day-in, day-out jobs. We use all Tobin-Arp equipment. With out-of-round rod bores we face off the caps on the cap miller at the right of the boring machine in the second picture. Its used for main bearing caps too. Pin bushings are pressed out and new ones are inserted on the press. Pressing arbors are kept handy. With the cap torgued to the rod, the big-end bore is accurately sized. The rod is then reversed. A pneumatically-expanded mandrel in the bore is held in the fixture on the column.

Correct center-to-center distance is then set. The pin bushing is then parallel to and at the right distance from the big-end bore. Tool settings for proper clearance of the pin in the bushing and piston bosses are made by comparison with the pin to be used. Tools are shaped and sharpened on the grinder and settings to the pin diameter are made in the vee-block comparator to the right of the grinder (bottom picture).







"Rebuilt engines are run in on this stand we made. Motoring helps seat rings and other parts. A dynamometer would be ideal but since we do so many 'short block' jobs where we don't have all the parts to build a running engine, its use would be limited. Engines are motored at 400 to 800 rpm. The motor is 5-hp. Open lube oil passages are blocked and the system pressurized by a motor driven pump. Later, the engine's pump can be used. Checks can be made for leaks, pump efficiency (particularly at idle speed) and relief valve adjustment. Engines are motored for one or two hours. An anti-rust additive is used in the oil and this gives good protection for engines stocked for any time. Of course, all the oils are filtered."

DIESEL ENGINE MANUFACTURERS RECOMMEND.....

A SIOUX No. 682 Valve Grinding Machine is shown grinding valves in head reclamation operations for Diesel locomotives. This picture was taken in the FRISCO Diesel Shop at Springfield, Missouri.

VALVE GRINDING MACHINES

When it comes to the big jobs, there's nothing like the SIOUX No. 682 Valve Grinding Machine for ruggedness, speed, precision, and dependability.

The No. 682-L, equipped with lever operated chucks, has capacity with two chucks, for ¼" to 1¼" valve stems, and 6½" valve heads. It takes valves up to 18" long with aligner, no limitation when chuck bushings are used.

and...

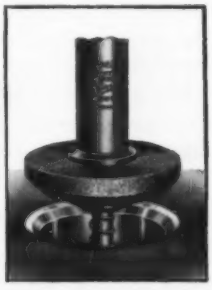
VALVE SEAT GRINDING EQUIPMENT

The greatest possible accuracy can be obtained with the SIOUX Dual-Action Valve Seat Grinder and SIOUX Tapered Pilots. SIOUX Tapered Pilots are precision tools and offer the most positive guide known. Dual-action is a controlled fine vibration for grinding and dispersion of the cuttings with the grinding wheel mounted for full contact with the Valve Seat. A perfected system.

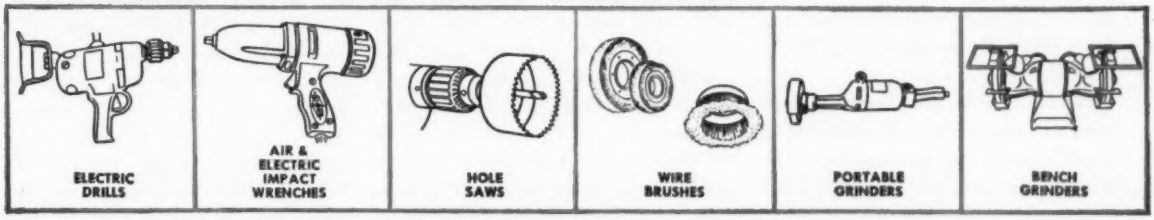
Factory approved sets for Allis Chalmers, American Locomotive, Baldwin Locomotive, Case Tractor, Cooper-Bessemer, Ferguson Tractor, General Motors Corp., Hercules Engines, Ingersoll Rand, International Harvester Tractor, International Harvester Truck, John Deere, Massey Harris, Minneapolis-Moline, National Supply, Onan Motors, White's Superior and Atlas engines.

LEFT: Heavy Duty Dressing Tool shown with Heavy Duty Driver dressing grinding wheel.

BELOW: Lifting spring is placed on pilot and grinding wheel brought up to speed before grinding.



USE SIOUX ALL THE WAY THROUGH... *Standard the World Over!*



ALBERTSON & COMPANY, INC. SIOUX CITY, IOWA, U.S.A.

Today's diesel man

• his knowledge and ability keep diesel equipment rolling—working for the company full time.

• he is the man who decides what to buy—by item and by brand, he has to be sold first.

• he is the key to an efficient and economically run diesel operation through his combination of skills and product knowledge.

Mike Galdiero, Superintendent of Maintenance, Yonkers Railroad Co.

MICHAEL A. (Mike) Galdiero started his career in the diesel field a little over 20 years ago as a mechanic's helper with Mack. In the years that followed he worked his way up to mechanic. From 1947 through '52 he worked as a trouble-shooter in the field for Mack. His experience was predominantely with buses. Today, he is the maintenance superintendent of one of the countries most outstanding bus fleets, The Yonkers Railroad Co.

Mike learned his profession by working at it. His practical experience has been augmented by a session at Mack's Service School and his work in the service during World War II.

His job with The Yonkers Railroad Co. is an extensive one. He is on call twenty-four hours a day. "It's part of the job," Mike says. "The buses run round-the-clock. My job is to keep them running."

Sick Transit—then Glory . . .

President Samuel S. Schreiber, together with his able maintenance force, literally pulled the ailing Yonkers Railroad Co. out of the scrap pile. When the firm was purchased from the re-organizing Third Avenue Transportation Co. it was in pretty sad shape.

Have Diesel — Will Travel . . .

In 1952 dieselization began. Fifty new Mack buses were purchased then, 5 more in 1953. Today, these buses are still in operation. Only one or two of the diesel engines have ever been out of the chassis. Most of them have logged well over two hundred thousand miles.

Mike's maintenance department has done a tremendously effective job of keeping the Yonker's Macks in service—and as economically as possible. Evidence of the job he has done is reflected in that Yonker's fare still stands at 10c. And this despite a 50% increase in wages and continually rising operational cost.

Mike Galdiero is a diesel man. He knows and believes in the job diesels can do in this field of continuous bus service. And it is mighty tough service at that. Because of the steep hills over which much of the firm's lines run, buses average under 4 miles per gallon!

Let's take a look at the way Mike runs his shop.

Controls Key PM Program . . .

Preventive maintenance on the standardized Mack fleet is backed up by an efficient inspection and servicing program. But the real key to the success of the overall operation is not only how well the program has been worked out but the fact that Mike follows through to see that every step is carried out. He exercises control through his own ef-

"There is no doubt that maintenance is a key factor in the success of our operation. Keeping maintenance costs down, yet giving us maximum in-service time has been one of the chief reasons for the fact that our 10c fare is the lowest in any metropolitan area in the country. In this way we serve our patrons and keep them riding our buses.

"Much credit must be given to Mike Galdiero. He has done an outstanding job as our maintenance superintendent."

Samuel S. Schreiber
President
Yonkers Railroad Company

forts and through his two well-trained assistants, Anthony Quartarolo, who also came to Yonkers with a great deal of diesel background, and Joseph Mauz, foreman responsible for floor work.

PM starts with daily servicing. The interval between thorough inspections has been set at 2700 miles, well below the reported industry-average of 4000 to 6000 miles. PM Work Sheets have been carefully prepared to tell Mike the specific things he wants to know in addition to showing that scheduled work has been done.

What happens to all these reports? Their value is far greater than an immediate indication of the vehicle's condition. Through intelligent interpretation they are, in consolidated form, a mechanical history of each vehicle. Projected over a period of time they can have a bearing on future work to be done, on costs, and in spotting trends in the overall operation of the fleet.

Seated at his desk, just off the shop floor, Mike showed us the master sheets which are his "bible". On this is a record of all work done on each unit. This includes repairs on the road under emergency conditions, during daily service when the bus comes off its run, and of course, the PM work.

Road calls come to Mike directly. Driver "door sheets", report anything out of the ordinary that might give an indication of mechanical trouble to come. Driver reports are turned in by the driver to the mechanic who performs the daily servicing. In turn, to Mike. If there is something really wrong with a unit, requiring it being held in the shop, Mike, or one of his foreman, is called in and the job is discussed on the spot.

By running down a column on his master sheet, Mike knows the mechanical condition of any unit in the fleet. He can tell how many times it has failed on the road and how frequently. He sees what the daily service work involves. He knows when the last PM check was made and can refer back to the PM Work Sheet readily.

What this boils down to is an efficient control system which, against the background of good preventive maintenance, keeps the buses rolling.

The Wayward Bus . . .

On road calls Mike had this to say. "I want as much mechanical work as possible done here in the shop. If a bus fails on the street, a mechanic goes out and tries to put her back in service. He can do minor repair work, like fixing a broken fuel line. But if extensive repairs are in order, I want that bus back here in the shop."

More control. By having the work done in the shop, where proper facilities are available, and where the work can be checked, Mike is intimately in touch with all maintenance work. That's the way he does his job. And that's one of the reasons why his record is one of the best.

Product Knowledge Pays Off . . .

Working as closely with his men as possible, Mike is continually adding to his knowledge of the equipment that keeps buses running. In addition to supervising all of the mechanical work, Mike is also responsible for specifying all of the parts and accessories purchased. This runs the range from soap for the daily wash-down, to fuel and lube oil. Mike told us about it.

"Sure, we try new products. Salesmen come in to see me and I ask them to leave samples. The product gets a run through the shop. If it stands up and is economical for us to use—we might buy. But by this time we feel we know pretty well what we need. Standard products and equipment with known values work for us and we stick with them.

"But there are always things to be learned. Jumping at obvious causes

(Continued on page 76)

"What's EMSA? It's the answer to a need. It has always made sense for men with the same interests and problems to get together for the purpose of pooling know-how and experience for the good of all. Other fields have done it and EMSA has offered this opportunity to equipment maintenance supervisors in this area. The maintenance supervisor, today, is more important than ever. He heads up one of the few remaining areas where costs can be controlled. The better he is informed and the more help he can get, the better the job he can do. He benefits, his company benefits, manufacturers benefit and the industry benefits.

"What's ahead? Some of us felt EMSA would just be local. Its growth, leading to incorporation, and continued expressions of interest convince me it has national appeal. Maintenance supervisors, master mechanics, call them what you will, are a specialized group whether they be in the trucking, logging or mining industries. One common interest is the diesel engine. Each can learn something from the other. We started EMSA with maintenance supervisors of construction equipment in mind. With interest spreading to other fields, perhaps the "E" will stand for all types of equipment, the common bond being that specialized individual—the maintenance supervisor."

Sam Weatherbie,
President EMSA

EMSA

California maintenance supervisors share and solve problems

DURING the Caterpillar strike last fall Caterpillar's southern California distributor ran out of engine head gaskets. This put Charlie Mann, maintenance superintendent for the Osborn Construction Co. of Pasadena, Calif. in a bind—but only temporarily. He called a cross-town competitor, Bob Moodie of the J. A. Thompson & Sons Co. and arranged to borrow the needed gaskets until the strike was over.

Four years ago the bind that Charlie Mann found himself in would have lasted the duration of the strike. He wouldn't have considered calling a competitor for assistance of any sort. Today, thanks to an association of maintenance supervisors, Mann and hundreds of other maintenance people in California are reaping the benefits of sharing problems, needs and advice.

The group, called the Equipment Maintenance Supervisors Association, is the outgrowth of a need expressed by several of the supervisors at a general contractors meeting in Los Angeles four years ago. Until that time, competitive rancor had prevented communication among all but a handful of southern California's heavy equipment contractors. From an informal conversation among a half dozen maintenance supervisors at the contractors' meeting in 1955 came the nucleus of the present group.

EMSA, now in its fourth year, is dynamic, large and growing rapidly. Full membership status is accorded maintenance supervisors in the construction industry. Associate (non-voting) membership is extended to sales engineers of various manufacturing firms. The Los Angeles group has 140 members and chapters chartered in the San Francisco and San Diego areas have between 60 and 70 members each. Interest in the formation of other EMSA groups has come from as far away as Boston.

Operating on the premise that all maintenance supervisors are anxious to head off problems before they arrive, and handle them quickly when they can't be avoided, the association lays heavy emphasis on education. Monthly meetings achieve this through two methods: well-organized, semi-formal presentation of technical information (lubrication, welding, injector servicing, etc.) and through extensive informal discussions before and after each meeting. It is during these discussion sessions that equipment supervisors, often with the assistance of sales engineers, thrash out mutually perplexing problems to the benefit of all.

Why limit the group to supervisors from just the heavy construction industry? The need, as expressed in the formation of the group, was that of men active only in the heavy construction industry. Now that the communication barrier within the heavy construction industry has been relaxed, EMSA officers are considering expanding the group to include supervisory maintenance people from industries such as the fleet truckers, machine shops and aircraft industries. A good deal could be gained from this expansion — knowledge about tools, procedures, materials, etc. "Look at the aircraft gear cutters," observed founding-president Leo Ryser of Peter Kiewit. "Imagine the reduction in our gearbox maintenance problems if we had polished gears in our rigs!"

Growth potential of EMSA is being determined by attitudes such as Ryser's. Enthusiasm shared by these men for their association is reflected in a soft-spoken comment by Association president Sam Weatherbie. "We've done an awful lot for each other, and we've really enjoyed doing it."

SAM WEATHERBIE
PRESIDENT

R. R. MOODIE
VICE PRESIDENT

R. F. CURRIER
VICE PRESIDENT

DAN STODDART
TREASURER

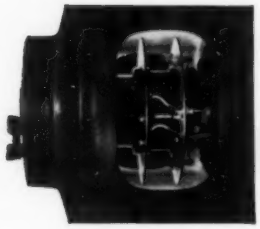
I. S. SHULL
SECRETARY

SPECIAL
GENERATOR FEATURES—NO EXTRA COST!

This new Delco Safe-T-Generator offers greatly improved safety, far lower maintenance costs and economical flexibility . . . yet it costs no more than a conventional type generator!

Designed specifically for off-shore oil rigs, railroad refrigerator cars, shipboard uses, abrasive dust areas and troublesome weather conditions, this new generator uses an AC exciter with silicon rectifiers instead of the conventional exciter with DC commutator. This design eliminates arcing dangers, also direct contact between moving parts . . . for new safety, less wear, less downtime. It is housed in the same frame size and has the same mounting and physical dimensions as conventional AC generators of the same kw. rating and r.p.m.

Conventional or Safe-T-Generator, Delco's advance design has earned a world-wide reputation among leading engine and powerplant builders for quality, dependability and economy. Wherever power from 10 kw. to 350 kw. is required, a Delco generator can meet the need. For new safety and trouble-free performance, get all the facts from Delco soon!



NEW SAFE-T-GENERATOR DESIGN IS SAFE, COMPACT, PRACTICAL

No commutator, slip rings, brushes—no sparks! Built-in exciter, housed inside bearing under stator coils, saves space while all parts are easily reached through large holes in end frame, and are replaceable without removing alternator from engine.

GM GENERAL MOTORS

DELCO MOTORS

Delco Products, Division of General Motors, Dayton, Ohio

- APPLIANCE MOTORS
- GENERATORS
- INDUSTRIAL MOTORS
- HERMETIC MOTORS AND CONTROLS

National Marine Service specialists work on big or small engines—anywhere. On pipe line engine overhaul job even a bulky tractor gets attention.

Engines need overhauling?

You can't take big engines to an overhaul specialist. How about taking the specialist to the job? National Marine does it . . . saves the owner both in better job quality and shorter downtime.

OPERATION is one thing; engine overhaul is another. Each is a separate and distinct job requiring different knowledge, skill and tooling. Maximum proficiency in either job is developed by *doing* and *doing steadily*.

Operators develop a high degree of skill in their scope of work through day-to-day doing. It isn't reasonable to expect them to develop the same proficiency in overhaul work that might occur at well-separated intervals.

Accepted practice for small engines and those installed in mobile equipment is to take the engine to an overhaul specialist. This makes sense. Overhaul and rebuilding shops have developed proficiency in their field also by doing. Plus this, constant flow of this work makes it economic for them to invest in the special tooling that permits these jobs to be done faster and better.

But what about the big stationary engine or angle compressor that you can't take to the shop? The answer is simple—take the specialists to them. A good example of both types of operation is found in the work of National Marine Service, Inc.

How Ideas Start

National Marine Service, Inc. (formerly Lake Tankers Corporation) is one of the largest contract petroleum and bulk chemical carriers on the inland waterways. Their experience in operating towboats showed a need for specialized engine overhaul facilities. They formed a separate division for this purpose with the original scope of providing engine overhauls, salvage and general marine repair for towboats and barges.

The men who implemented the idea are top-flight—Capt. R. F. Clark, vice-pres. of operation, along with A. C. Grammer, Harrel Brannan and Oliver Lee. E. E. Ahlemeyer supervises the Hartford, Illinois facility. Engineers on the job are V. C. Black, P. R. Stephenson and Robt. Gamel. Right in this group is over 100 years of diversified marine and engine experience.

Business boomed. Why? Fast, high-quality overhauls or emergency repairs were available to towboat operators. Shop headquarters is at Hartford, Illinois, just above and across the river from St. Louis. But though towboats come under the heading of "mobile equipment", in emergency and when other conditions prevail, work had to be done in other locations.

Special division was formed originally to service towboats and barges. Here, engine in lake tanker Volunteer Cities gets 12-hour overhaul by NM repair crew.

Call a specialist . . .

So engines were brought to the specialist for overhaul or the specialist taken to the engines. From this point it is a natural step to expand this service to land-based operations. National Marine Service has done just that.

The need, first seen to exist in the marine field, also exists among municipal, utility, pipeline and industrial engine or angle compressor installations.

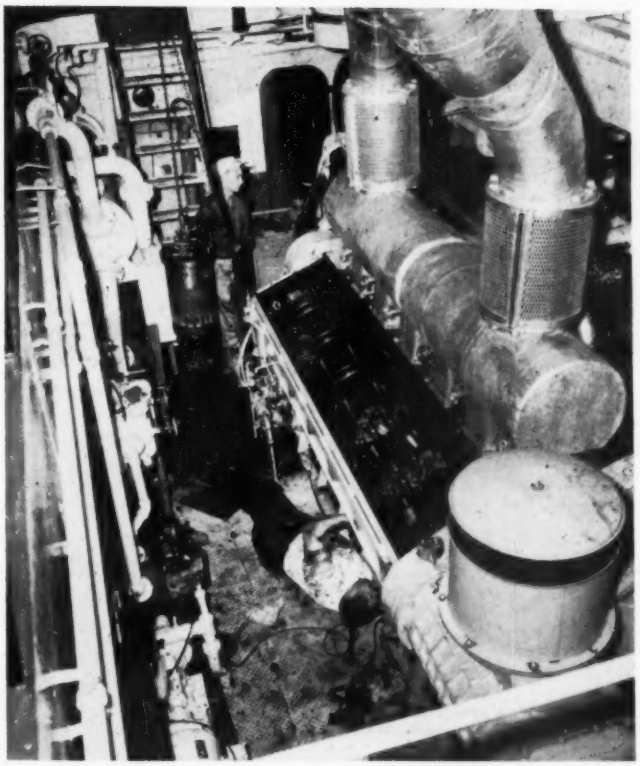
What the Owner Gets

Engine owners now have as close as their telephone a complete heavy repair and overhaul service. The job is pre-planned, parts obtained and then an experienced crew with highly-skilled supervision moves in, does the job and moves out.

The owner can provide for overhauls without pulling men from their regular jobs which would then suffer. There is no need for investment in special tooling that would sit idle most of the time. He is guaranteed a quality job. Plus this he is buying a precious commodity—time.

Downtime is always costly. National Marine Services found this out

(*Continued on Page* 36)



Reconditioned power assemblies being installed in the engine frame. Pre-planned job is well along. Boat owner can be sure of getting back into operation with minimum of delay.

on the rivers and took steps to cut it. As an example, they offer a 12-hr overhaul on a GM 12-567 engine at Wood River or other selected locations. Similar schedules are set on other engines based on experience of the time required for that particular job. Work goes on around the clock if necessary.

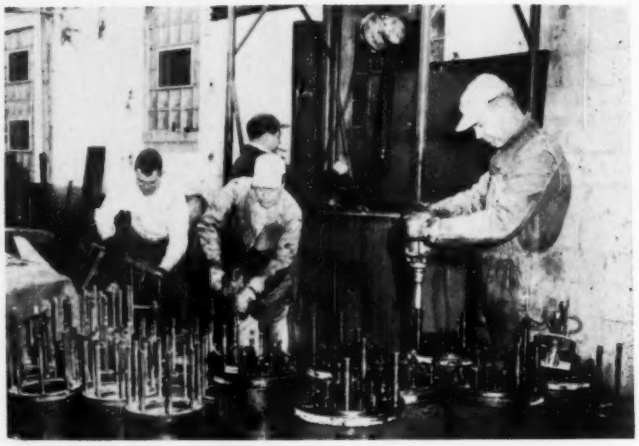
Since expanding into stationary engine work, several jobs have been done successfully and to the satisfaction of the owners from both a cost and time point of view. In one case, several pipeline engines have been done for a major oil company. This company found the service both convenient and economic.

In Summary

Engine overhauls and heavy repairs are jobs for specialists. There's no substitute for day-in and day-out experience both in obtaining job quality and rapid completion. Any premium rate for employing specialists is usually compensated by the greater amount of work done in a unit of time. The high degree of utility makes investment in specialized tooling practical for this work.

In big outfits with enough overhaul work to keep a crew busy continually similar results may be obtained. But it takes a lot of engines. In smaller outfits where overhauls are a spot job, availability of specialists should prove a blessing. The payoff is twofold—better job quality with shorter downtime.

1.



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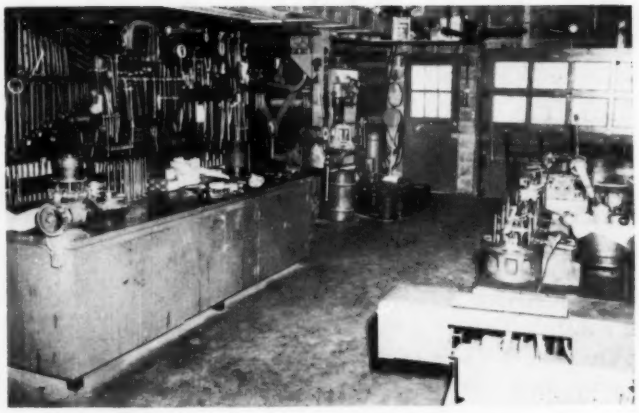
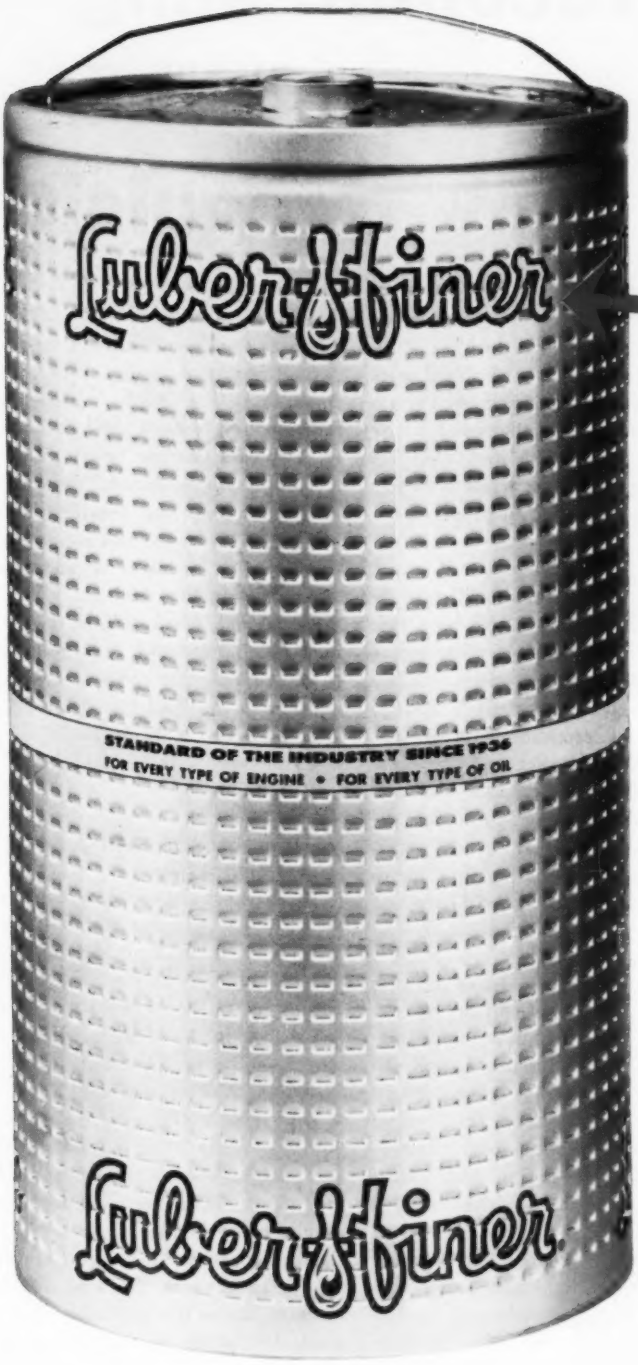


3.

1. Disassembly and parts cleaning are done outside NM shop. Note boiling tank. Thorough cleaning is important part of good repair job.

2. Clean, efficient shop backs up specialists in the field. Here component rebuilding plays a part in the teamwork of National Marine's crew.

3. Parts availability means a time saving. Part of National Marine's preplanning is having needed parts ready to go out to the job.



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Rod reconditioning—rebuilding requisite

ONE of the most often overlooked but vital engine rebuilding operations is reconditioning the journal-end of connecting rods. The usual explanations for neglect are:

1. The age-old reason—"We never did it before."
2. "Did not recognize the necessity."
3. "Didn't realize it could be done so easily and accurately."

Why today's emphasis on reconditioning . . .

There are several reasons why rod reconditioning is more important than ever. Earlier model engines did not develop the high power output required in today's engines. They used rugged, heavy rods, low rpm's and rod bearings were available in semi-finished condition so that they could be finish bored to size in the rods in which they were to be used. This compensated for any stretch or distortion in the rod bearing seats.

Today's engines demand more of the rod. Cylinder pressures are continually increased and engine weight is becoming critical. Therefore, moving parts such as rods are designed and engineered to be as light in weight as possible—rpm's are greater also. These factors lead to more stress being placed on the con rod, resulting in greater distortion and stretching of the rod bore in service. Although this distortion in the bearing seats is only measurable in thousandths more than two thousandths error is often fatal to life of modern precision bearings.

Bearing manufacturers have developed products to withstand these greater loads with a new non-resizeable type insert. The bearing metal alloy liner bonded to the steel back remains a constant thickness regardless of bearing undersizes. These bearings are flexible and will conform to the rod bore when placed in the rod and torqued to proper specifications.

If the rod bore is out-of-round, the new bearing insert will also be out-of-round. Thus a rod bore that has stretched or become distorted in use should be reconditioned before these new bearings are installed. If they are not reconditioned and made round and to exact specified diameter, improper clearance and possible bearing turning in the rod may occur. The pressure or "crush" necessary to hold the bearing in place in the rod will be diminished because of this stretched and over-size rod bearing seat.

Tools for a fast, precision job . . .

Sunnen Products Company has developed rod reconditioning equipment that enables the user to recondition these rods easily and accurately to factory specifications. This method consists of a two-step operation.

The first step is to reduce the elongated rod bore slightly by removing stock on the parting line of the rods. This reduces the rod bore diameter to a slight under-size. This must be done accurately and carefully so that the rod bore remains square with the sides. A convenient way to accomplish this is with the Sunnen cap and rod grinder.

The second step is to hone the rod back to factory-specified standard size. This operation is performed with Sunnen's honing machine and gauging equipment. This is an important step and assures a perfectly round rod bore. When finished, the bore should form a perfect cradle for the new bearing insert and establish the precise "crush" dimension required to lock the bearing firmly in position when the rod is torqued. No distortion or stress is placed on the rod using this method.

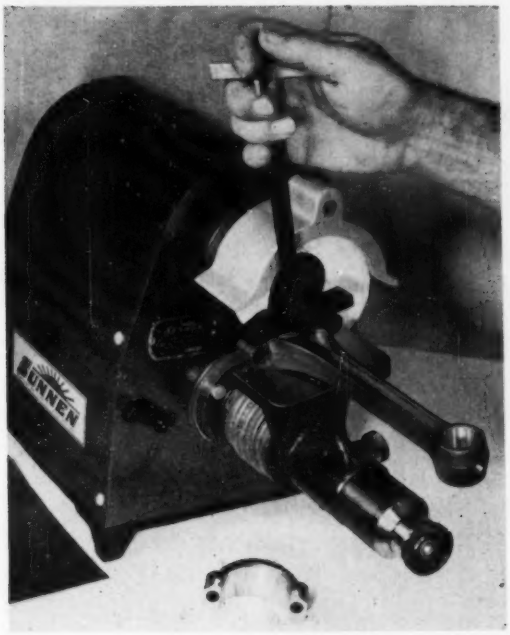
The round, accurate bore (within 0.0001 in. accuracy) thus forms a perfect seat for the rod insert. Exact clearance is obtained for adequate lubrication. Also, bearing shells make 100% contact with the rod for perfect heat transfer.

Multi-purpose capability means high utility . . .

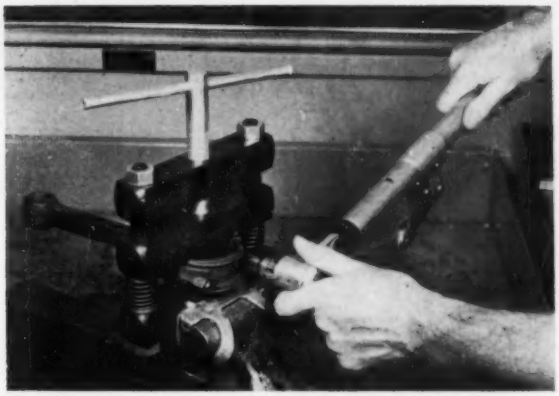
The Sunnen method of rod reconditioning and gauging is widely used in engine rebuilding and maintenance shops. Honing tools are available to recondition rods with bores from 1.500-in. to 4.700-in. diameter when used with the Sunnen model LBB-1300 honing machine.

This same honing machine can be used for many other critical sizing and gauging operations such as wrist pin fitting, king pin fitting, hydraulic brake honing and other hole sizing from ⅜-in. to 3⅜-in. diameter. Versatility and low cost of this machine makes it a profitable investment for every engine rebuilding shop.

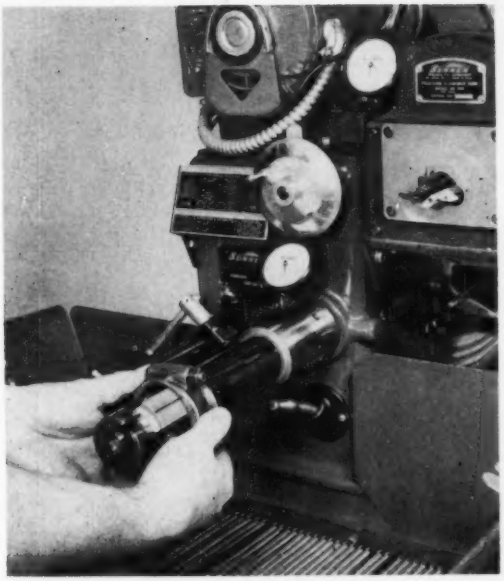
In conclusion, connecting rods in today's engines must be reconditioned. It can be done simply, rapidly and accurately with modern tools and procedures. Don't overlook this vital job.



Correcting bore elongation by grinding the ends of cap and rod. Clamping of cheeks to surface plate insures end squareness after grinding. Vernier at bottom controls stock removal. Automotive rods are shown; principle applies to all rod sizes within machines' capabilities.



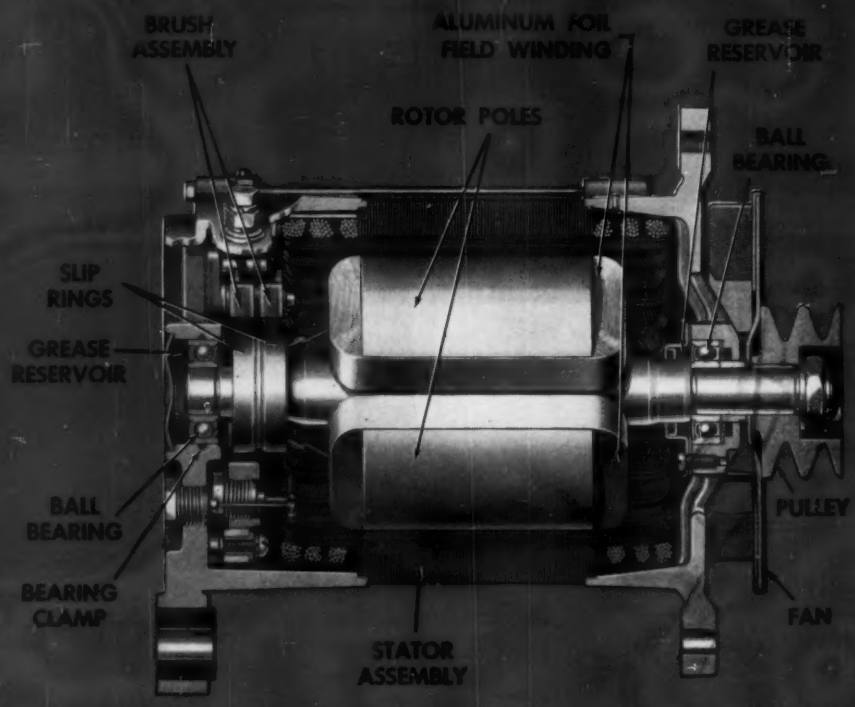
Fixture holds and aligns rod and cap while nuts are torqued to proper specification. Proper torquing is vital.



Bore is honed to correct size. Stones in mandrel are adjusted by calibrated dial above the arbor until factory specified bore diameter is obtained.

Hole gauge with an accuracy to 0.0001-in. is used to check the geometry of the finished bore.

NOW! REAL CHARGE-AT-IDLE,



PROGRESSIVE ENGINEERING MAKES THE DIFFERENCE

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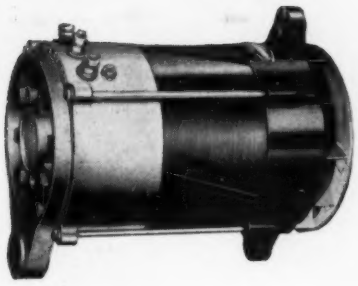

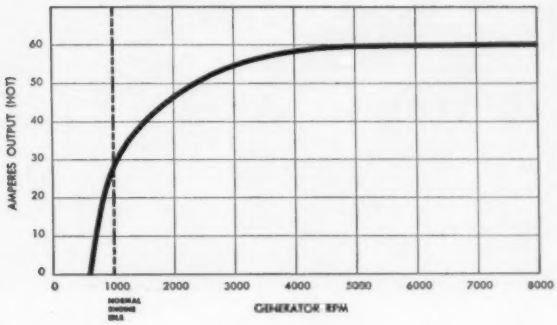

Here's a completely new generator from Delco-Remy *specifically designed* to take care of cars and trucks with extra-heavy electrical loads under all traffic conditions . . . to increase battery life by eliminating deep cycling.

Designed to mount interchangeably with most standard d.c. generators, this compact new unit is only 5¾" in diameter and weighs just 31 pounds. The a.c. design eliminates commutation problems, providing extra-long brush life . . . and the ball bearings are "lifetime" lubricated so that no attention is required between engine overhaul periods. Six specially developed silicon rectifiers built into the end frame eliminate the need for space-consuming external rectifier units, reducing installation time and cost to a minimum.

Be sure to specify this new self-rectifying a.c. generator along with its companion transistor regulator (either full or transistorized model) on your new special-duty equipment for 1959. This all-new power team is still another example of Delco-Remy progressive engineering at work for you.

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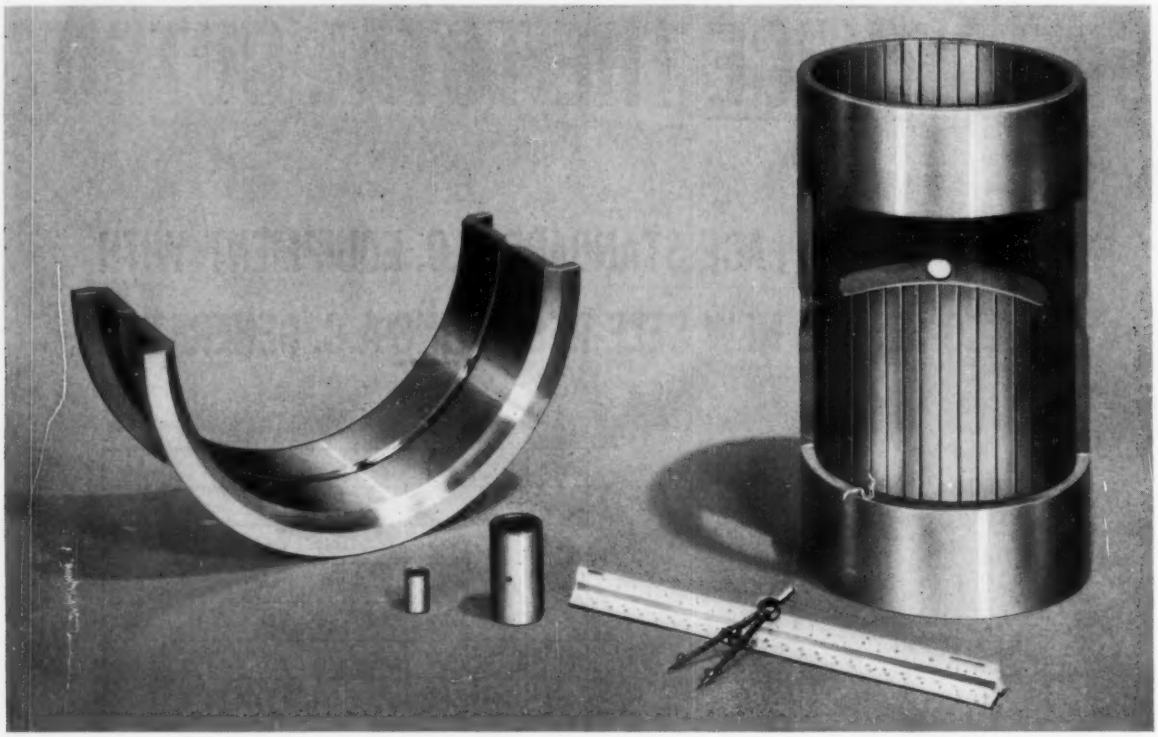

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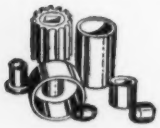


POWDER METALLURGY—BRONZE OR IRON

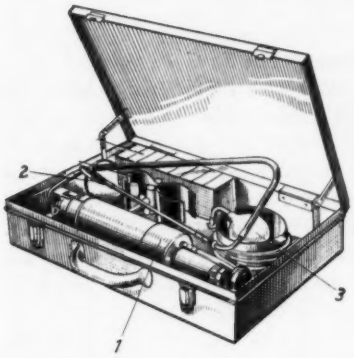
ALUMINUM ON STEEL SOLID ALUMINUM

BRONZE ON STEEL

STEEL AND BABBITT

GRAPHITED BRONZE

BRONZE—CAST OR ROLLED



Kit contains (1) sampling pump with (2) gas sampling probe and (3) pneumatic tripping device.

Robert Bosch Smokemeter

An accurate, simple-to-operate device for measuring diesel exhaust smoke levels . . . a dual purpose tool to fill an important industry need.

Photo-cell light source (A), throws beam on darkened filter paper disk (B). Unabsorbed light is reflected on annular photo-cell. (C).

DIESEL engine exhaust smoke has been, and will continue to be an area of increased interest both within the industry and, of late, to the public. As more and more higher output engines go into the nation's ever denser traffic, atmospheric contamination will become of prime importance in the public eye. And to that same public eye, diesel smoke is blacker than gasoline engine exhaust, this despite the fact that diesel exhaust is considered less toxic than gasoline engine exhaust.

Thus, smoke levels are an industry problem and responsibility. It is up to the industry to work with local and national organizations involved in establishing standards of permissible smoke limits. We have the equipment for accurate measurement of exhaust smoke.

Where there's smoke . . .

Diesel engines may show exhaust over a range from white, through shades of grey and blue, to black. White, or slightly bluish smoke is caused by the presence of very small liquid droplets in the exhaust gas. These droplets might be lube oil if the engine's oil consumption is high. Or they are fuel which is thoroughly atomized and, perhaps by contact with hot combustion chamber surfaces, have been turned into fog which has not burned. There is a possibility that they may have been oxidized to a very limited extent.

White exhaust smoke is somewhat uncommon. This is due to the fact that conditions causing this also cause a drop in engine output and indicate high lubricating oil consumption and lube oil dilution. Such conditions are usually quickly corrected by the engine owner.

Black or grey smoke appears when partial oxidization has taken place but combustion has been incomplete so that intermediate combustion products, extremely rich in carbon are being exhausted. What causes this condition? Lack of air for one thing. Excess fuel for another, or any other factor which can effect turbulence, compression pressure or ignition lag. Here are a few—

1. Leaking valves
2. Fuel injection equipment out of adjustment
3. Leaking piston rings
4. Plugged energy cell or precombustion chamber
5. Faulty head gasket
6. Restricted air intake system or exhaust system
7. Unsuitable fuel (viscosity, cetane of specific gravity)

One percent of the injected fuel at full-load, if converted into soot, is enough to produce prohibitively dark exhaust.

Let's consider a big 6-wheel rig on the open road. On the level, exhaust smoke is a feather of blackish haze. Now we start up a long grade. The driver tromps on the throttle and pours in the fuel. But engine speed is slowing down under load. We've got too much fuel and not enough air being drawn into the engine. (Remember here that air flow is related directly to engine speed). The excess fuel becomes a cloud of black smoke.

Here is where the smokemeter comes in. We know that power increases as the engine approaches the smoke limit. We want the power—but we don't want the smoke. Thus, to set the maximum fuel stop, we need a tool which will measure the degree of exhaust smoke under load, accurately, reliably and with reproducibility. In this way, we get the most power without objectionable smoke.

How black is black?

Traditionally, smoke level has been measured by someone looking at the smoke and assigning an arbitrary scale number. This method is woefully inaccurate. Density of smoke is unknown. The background color against which it is viewed plays a part. Available light is a factor. And we are dealing with the judgement of an individual.

Photographic methods involve complex equipment. The system of visual comparison with printed standards is inadequate. Such readings must be made in rough steps and again, reading depends on the light and the observer.

(Continued on Page 44)

The accuracy and dependability of a mechanical device with modern sensing equipment is the answer. Fair and accurate readings can be taken by anyone using such equipment at any time, any place. This gives law enforcement people, responsible for detecting violations of local ordinances, a means of establishing a standard with which to judge smoke levels.

Here are a few of the most desireable elements such a device should have.

Obviously, it must be portable, simple to operate. It must be suitable for both lab and field including on-vehicle tests. It must be accurate and have a fixed sensitivity. It must give rapid and repetitive readings. Its initial cost must be low.

Robert Bosch Corporation's Smokemeter seems to fill the bill. It meets the requirements listed above. As illustrated, it is compact and portable.

Here's How It Works

The equipment consists of a sampling pump with a probe which is inserted into the exhaust line. A pneumatic actuating device permits remote control from the cab for on-the-road tests. Mounting clamps and filter paper disks are included. A specific amount of exhaust gas is taken from the line and breathed through the filter disk. This darkens the filter.

Samplings can be taken almost instantaneously when desired condition is attained. Evaluation of the sample can be done at any time and the same disk can be evaluated repeatedly. The photo-cell unit is separate and need not be carried around with the testing equipment. When evaluation is made, this unit is placed on the filter and a beam of light is turned on. Unabsorbed light is reflected from the darkened disk and this generates a photo-cell current corresponding to the degree of darkness. Amount of this current is read on a scale which is calibrated from 0 to 10.0. The 0 reading represents reflection from an unexposed filter and 10.0 complete blackness.

Now, what have we got?

Can we get that black diesel smoke out of the public eye? First, we have the capability of establishing standards of acceptable smoke levels through the use of such equipment as the Robert Bosch Smokemeter. These standards will mean fair enforcement procedures—a uniform system of judgement.

Secondly, fleet owners have the capability of setting their engines for maximum power just short of the objectionable smoke level.

The capability to accurately measure smoke level is a maintenance tool. You can readily detect overfueling which might be the result of poor engine condition or any of the causes listed previously.

So, whether used in setting up smoke level standards or as a maintenance tool, smokemeters benefit the engine user.

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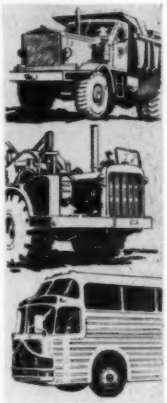

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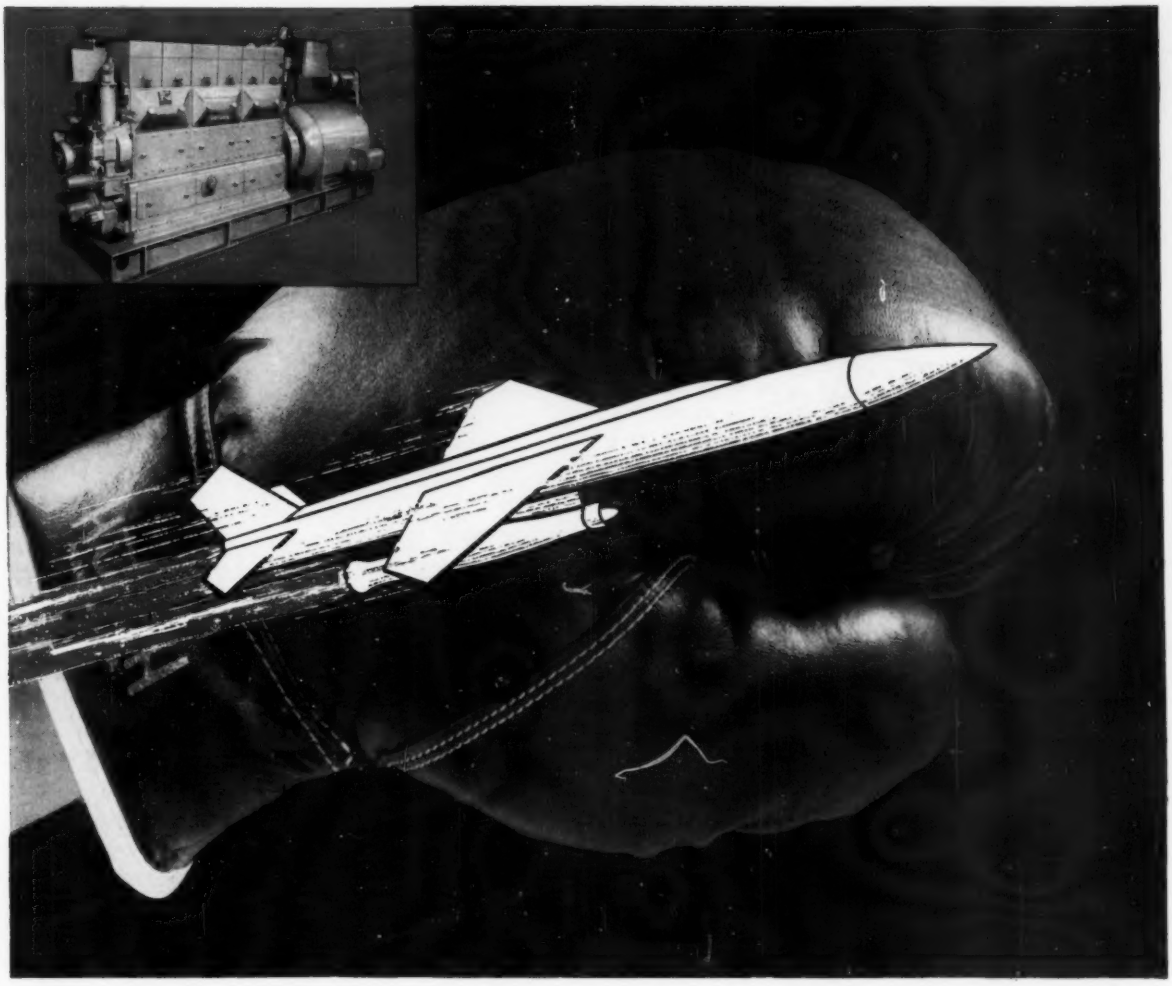

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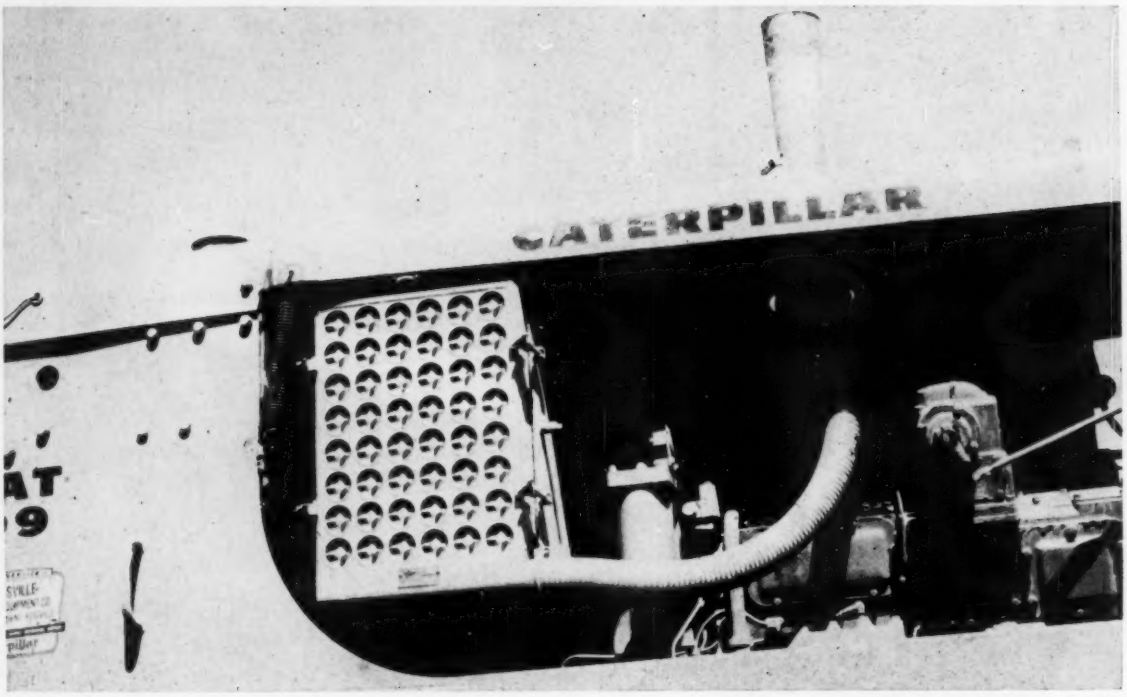


Close up of Roto-Pamic air cleaner on Cat D9.

Clean air cuts engine wear . . .

ENGINES don't make the abrasive dirt that wears them out. It comes from outside the engine and most of it is in the air the engine breathes. The correlation between the amount of airborne dirt and engine wear is well recognized or in view of all the available data, should be.

The battle for cleaner air has been waged for many years. And it's being won. Air cleaner designers have known how to do it in a practically-sized package that sells at a reasonable cost and requires minimum servicing. Then you get the maximum advantage from cleaning up the air.

How clean is clean . . .

Quoted efficiencies on good air cleaners are usually up in the high 90's. Is it worthwhile to argue for a percent or two? Look at it this way. At a 98% efficiency, the engine gets 2% of the dirt but at a 97% efficiency the actual amount of dirt entering the engine is 3% or 50% greater.

One air cleaner manufacturer, the Farr Company, found in the field that off-highway vehicles were sometimes operating in dust storm conditions with concentrations as high as 100 grams per 1000 cu ft. Under such conditions, if only 2% of the dust got through the filtering system it would wear out an engine in short order.

Many laboratory tests have been conducted to find out what dust does to an engine. Commonly, Standardized Fine Air Cleaner Test Dust (Arizona Road Dust) is injected into the air intake in known quantities and at known rates. Wear is then measured after a test run. For example, in tests using the particular radio-active piston ring measurement technique developed by California Research Corporation and Farr, it was found that top compression ring wear per unit weight of dust injected was a constant. Double the weight of dust and you double top ring wear.

Of course, the characteristics of airborne abrasives vary. Some cause limited wear while others continue to wear as long as they are in the engine. The harder particles remain intact and may become imbedded in metal parts to continue the wear process.

While there is evidence that there is some critical particle size producing maximum wear, depending on engine size, clearances, etc., there is also evidence that particles in the 0 to 5-micron range can cause excessive wear. In sufficient concentration, they apparently "mud-up" between

the piston and cylinder wall.

There is no way of controlling the size, type and concentration of airborne dust in actual operation. So the design objective is to develop a filtering system that will take it all out. At the same time the additional goals of minimum maintenance, maximum life and reasonable cost must be met.

Here's Farr's approach . . .

Spin, turn and filter . . .

Dry-type paper filters were known to be highly efficient. In fact, one problem is that they soon become too efficient as dirt builds up and increases their resistance to air flow. Porosity of the paper and total area can be balanced to give the required degree of filtration and initial resistance to flow. But used alone in high dust concentrations, this resistance builds up quickly and servicing, with eventual replacement, becomes necessary.

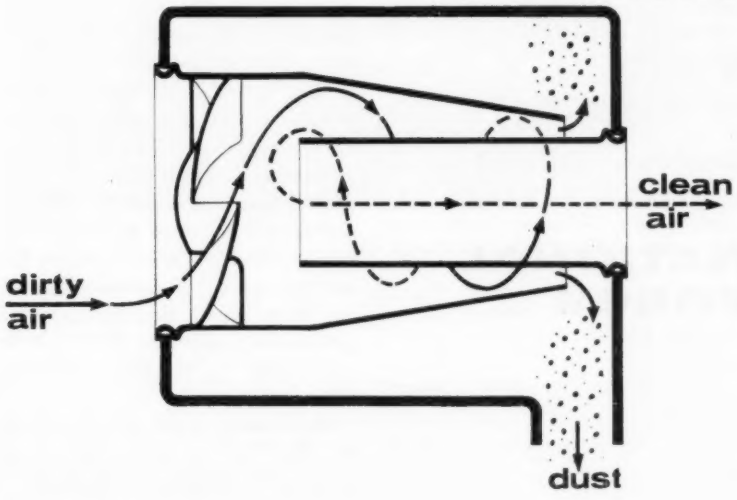
This could be avoided if the dirt load to the paper filter could be reduced. The result was 2-stage filtration. Farr had developed their Rotonamic centrifugal air cleaner as an answer for locomotive carbody filtration. Its high efficiency and self-cleaning capability slashed filter servicing costs while retaining about the same relative efficiency as panel-type filters.

Combining the cyclonic unit with a paper filter, efficiency of better than 99% was achieved. Furthermore, this efficiency is maintained over the whole range of flow velocities from idle to full speed, something difficult to accomplish with filters of other types. Precleaning, self-cleaning action of the "Roto" meant that the intervals between servicing of the "Pamic" paper element could be greatly extended.

Initial restriction of the Roto-Pamic filter is low—3.5-in. water, gauge. Actually, addition of the paper afterfilter, when new, does not increase the pressure drop as measured across the cyclone unit alone. Reason is elimination of the cyclonic outlet tube air expansion losses. Practically, this low initial restriction means that a greater dirt load can be handled by the paper element before cleaning is necessary.

The first stage of the Roto-Pamic uses centrifugal action and inertia for dirt separation. The action is illustrated. Over 90% of the total dust load and practically all particles down to the 5-10 micron size are separated and removed by bleed air.

Air flow through the Farr two-stage filter is shown below. Dirty air enters inlet tube. Deflector vanes set up cyclonic action. In primary chamber dust particles are centrifuged against walls, carried into dust bin by 10% bleed-off air and discharged into atmosphere through exhaust gas aspirator. Remaining 90% of the air reverses direction, is again centrifuged as it spirals back along discharge tube. Filtered air again reverses direction and passes through paper filter element, then into engine.



The second or paper-element stage gets only up to 10% of the total dust load. The less than 1% of the dirt getting through is below 2 microns in size. This is well below the critical particle sizes that tests have shown to create most wear.

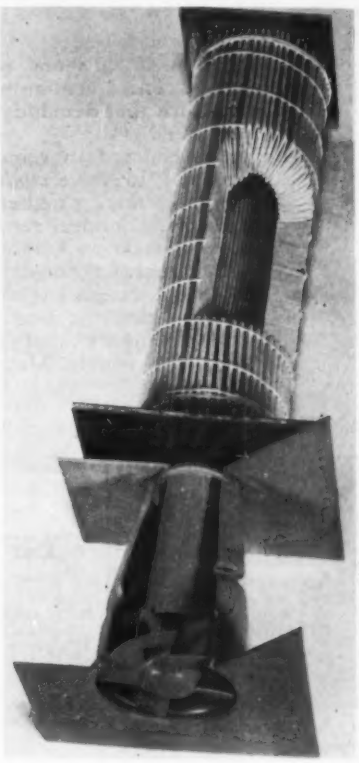
One other item in the complete system is an exhaust gas aspirator. Three types are built: a straight aspirator; an aspirator-muffler for moderate silencing; and a combination unit for maximum silencing. The aspirator's function is to provide positive flow of bleed air from the first stage of filtration to discharge dust back to the atmosphere.

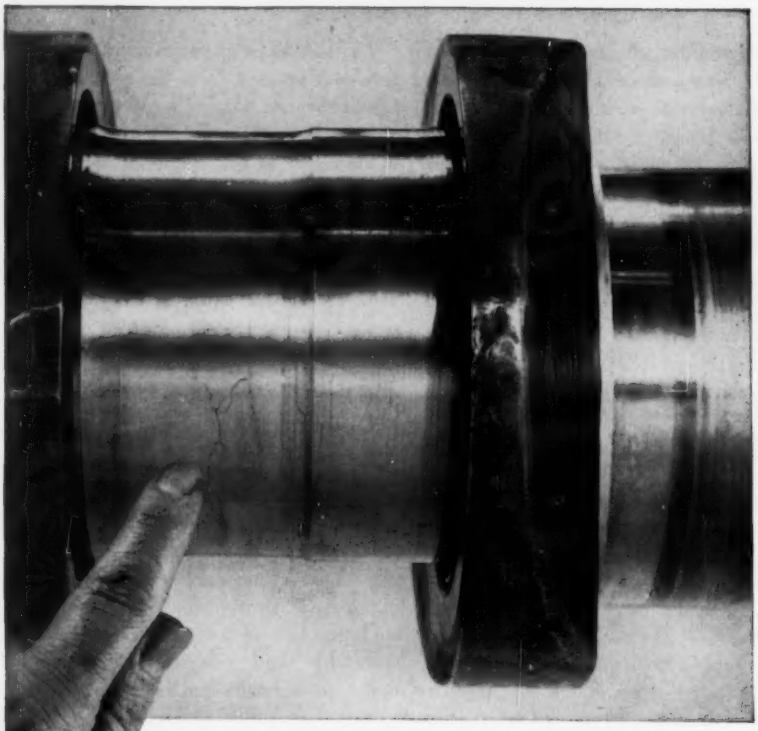
The aspirators incorporate a venturi design that guarantees minimum pressure loss and maximum pressure recovery. Properly applied, exhaust back pressure is not affected and no detectable bad effects have been noted on turbocharged engines.

The payoff for clean air . . .

Let's see the effect on the engine. A 2-cyl GM engine was put on test and fed Arizona Road Dust at a rate

(*Continued on Page* 48)





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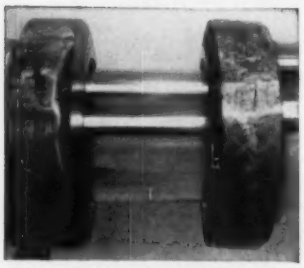
We've specialized in rebuilding crankshafts, because since 1916 we've *made* crankshafts. And who knows better than a maker what are the "musts" of a sound, economical repair job. We'll take your worn crankshaft and rebuild it, if salvagable, through the carefully controlled steps of grit blasting, replating, regrinding and thorough inspection. And we'll deliver it back with a guarantee for 100% performance that only a manufacturer-specialist can provide. May we quote on your next job?

For more details on crankshaft repair write for Bulletin RC-3



This is a finished, repaired crankshaft, after processing by National Forge.

NATIONAL FORGE COMPANY
IRVINE, WARREN COUNTY, PA.

(*Continued from Page 47*)

of 10 grams per hr. With the governor adjusted to hold 1800 rpm, the dynamometer was set to pull engine speed down to 1750 rpm. Load was 47 to 50 hp, the maximum obtainable with the injectors used. The Roto-Pamic system including the aspirator was used.

At 500 hours, inspection showed the following wear averages: Liner wear—0.0001-in.; piston skirt wear —0.0007-in.; average bearing insert wear, whole engine—0.0006-in.; and main and crank pin wear, whole shaft—0.00014-in. On this test, ring wear was lost as rings were mixed in cleaning. However at the 1500-hr inspection, representing just under 1000 hr on the rings, maximum wear on the top compression rings was 0.0024-in. on the face and 0.0023-in. on the width.

In a similar test using a conventional-type filter on the engine under the same severe conditions, the effect of airborne dirt can be told in one figure. At the 500-hr inspection, liner wear at the top of ring travel was 0.002-in. or 20 times as great. Reason enough for clean air.

The second payoff with modern 2-stage filtration lies in reduced cost of servicing—including labor, materials and less downtime. Here are figures on one operation.

A California company engaged in open-pit strip-mining of borax now has 18 different pieces of equipment with the Roto-Pamic filters. Formerly, filters were serviced each shift or twice a day. Labor and materials totaled $79.20 per day for the 18 pieces of equipment.

Now, filters go 1200 to 1600 hr per element or require servicing on the average of each 75 working days, for a saving of over $5000.00 in this period. Servicing is not a matter of guesswork. A gauge tells the total pressure drop and when it reaches the selected reading in inches of water, say 18 to 20, it's time to service or replace the paper unit. The cyclonic unit needs no regularly scheduled maintenance.

More reason to pay attention to air filtration and to take advantage of modern developments in this field.

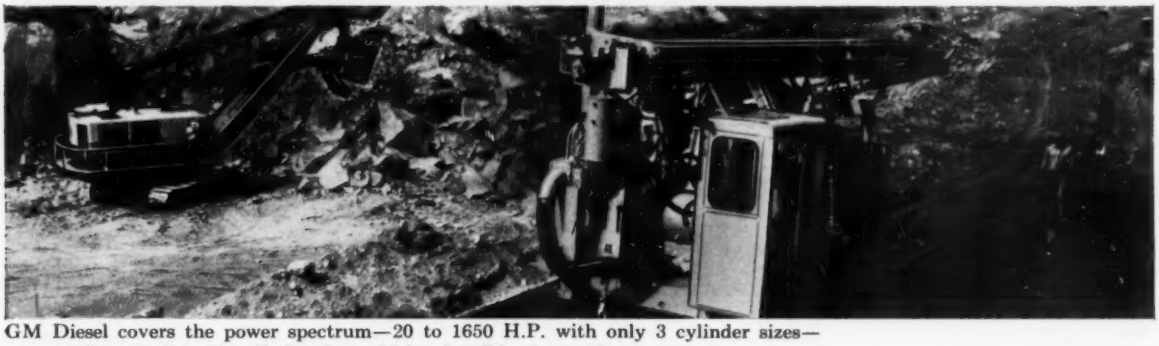
NOW YOU CAN STANDARDIZE WITH THE

all purpose power line

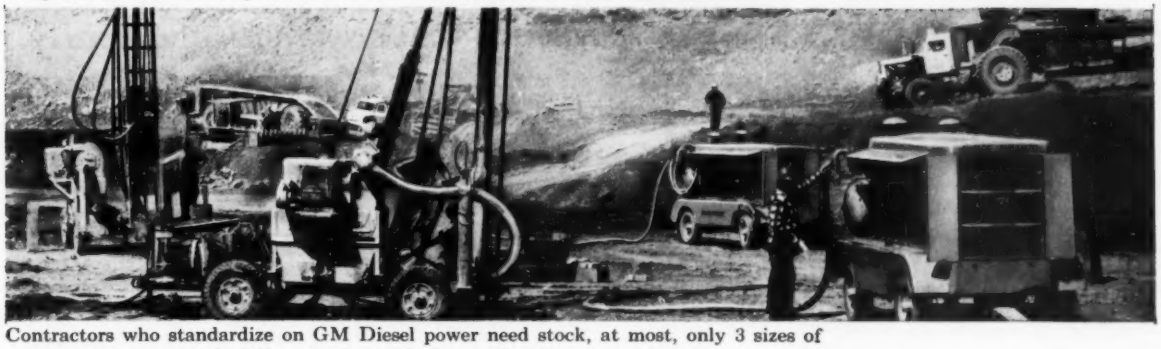
(20 TO 1650 H.P. IN ONLY 3 CYLINDER SIZES)

...and get all the benefits of GM Diesel standardization in any type of equipment built by over 250 leading manufacturers

Standardization with GM Diesel engines pays off big for contractors because fast-stepping, 2-cycle "Jimmy" Diesels power the finest equipment—get work done faster



GM Diesel covers the power spectrum—20 to 1650 H.P. with only 3 cylinder sizes—compared to the 5 to 10 cylinder sizes which other Diesel manufacturers use



Contractors who standardize on GM Diesel power need stock, at most, only 3 sizes of wearing parts—maintain full protection with the smallest investment in spares

GM DIESEL

PARTS AND SERVICE WORLDWIDE

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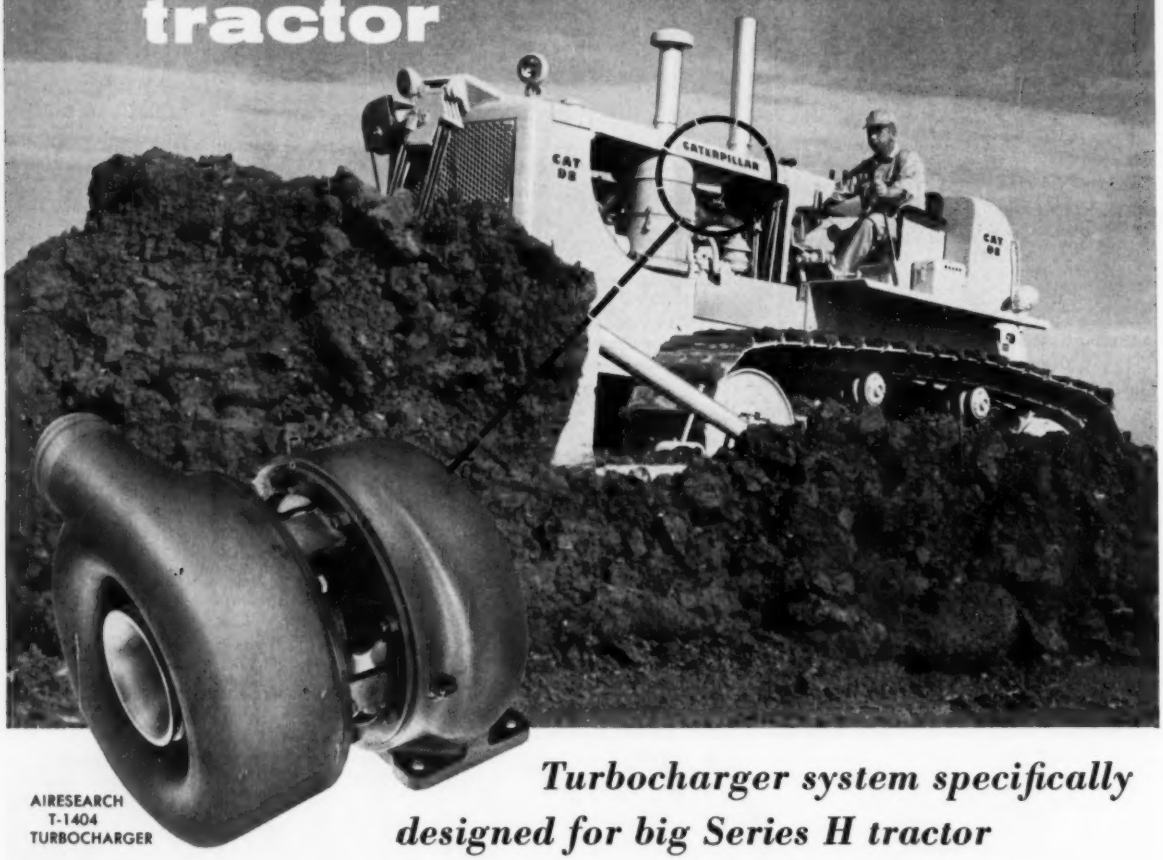
In Canada: GENERAL MOTORS DIESEL LIMITED, London, Ontario

More horsepower for the new Caterpillar D8 tractor



AIRESEARCH
T-1404
TURBOCHARGER

Turbocharger system specifically designed for big Series H tractor

A joint development of Caterpillar and AiResearch, the turbocharger system is an integrated part of the new D8 Series H tractor. Extensive field tests showed an increase of 20% in bulldozing and a substantial gain in pushloading production with the Series H... brought about by the tractor's greater horsepower, faster torque rise, greater weight and faster dozing and reverse speeds.

Specifically designed to match the new tractor's requirements, the new turbocharger underwent thousands of test hours on the new D8 operating in every kind of material on every kind of job.

AiResearch turbocharger advantages include: increased horsepower, improved lugging ability, cooler exhaust temperatures, reduced maintenance costs, less smoking and noise. This is another application of AiResearch turbochargers to heavy industrial machinery.

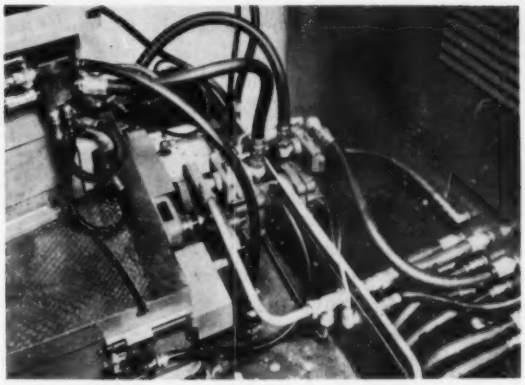
THE GARRETT CORPORATION

AiResearch Industrial Division

9225 South Aviation Blvd., Los Angeles 45, California

DESIGNERS AND MANUFACTURERS OF TURBOCHARGERS AND SPECIALIZED INDUSTRIAL PRODUCTS

How to select and apply industrial hose



Whether in diesels or the machines that make them such as this production grinder, industrial hose plays an important part.

THERE is hose—and hose. While it's certain that you can distinguish between a pair of nylons and a garden hose, how are you when it comes to industrial hose? If you're not sure that you could make the best selection for a given application and then see that it is installed properly, here's a guide for you.

Picking the right hose . . .

What is the hose to do? What's going through it at what pressure and temperature is going to determined the type and material that should be used. Size will depend fundamentally on the required flow at the normal available pressure. Practically, it will depend on fitting and connector sizes, associated piping sizes and similar factors of other system components.

The hose's inner tube compound determines whether it is suitable for the material to be handled. For example, butyl and some other rubber compounds soften and deteriorate rapidly in contact with fuel oil. For air, they would be perfectly suitable. A tabulation of liquid and gaseous fluids commonly used in diesel systems is plotted against inner tube compounds as a guide for selection.

Pressures are important. A fuel line may operate with a maximum pressure of 30 psi whereas a line to a hydraulic cylinder might have a 1500-psi maximum working pressure. Obviously, high-pressure hose is costlier to make than low-pressure types and there is no point in paying for the high-pressure capability unless it is needed.

Customarily, hose data specifies the maximum working pressure for each size of each type of hose. For example, one type may be rated 5000 psi with a 3/16 ID and 1875 psi in the 1-in. size. So be sure that any figures on allowable maximum working pressure apply to the ID of the hose you plan to use.

It's safe to work close to this figure since the hose is proof-tested to double working pressure and the minimum burst pressure is double this figure. The hose's resistance to pressure is obtained by use of reinforcing braid. In general, low-pressure hoses use one or more layers of cotton braid while wire is more commonly used on high-pressure types.

Temperature of the fluid must be considered. Suitable ranges are specified for each hose type. The low limit indicates the ability of the hose to retain its flexibility and physical qualities at sub-zero temperatures. It is usually minus 40°F or even below. The high limit, commonly from 200° F upward, pertains not only to the hose's physical qualities but to the effects of high fluid temperatures on the material of the inner tube.

Finally, you'll want to consider the outer covering. For example, hoses that are exposed to oils should have a covering resistant to them. Cotton braid and even armoring wire braid may be desirable where possibility of abrasion exists.

Consider the fittings . . .

Hose ends fall in two general types —reusable threaded types and permanent swaged or crimped types. Within each of these general categories are a wide variety of shapes to suit just about any purpose. What is the basis for selection?

First, what are the relative advantages and disadvantages of reusable versus swaged hose ends? The principal advantage of the permanent

	Butyl	Buna-N	GR-S	Neoprene	Teflon
Air	1	1	1	1	1
Fuel Oil	X	1	X	2	1
Fuel Oil (high acidity)	-	-	-	-	1
Lube Oils	X	1	2	2	1
Natural Gas	X	1	2	1	1
Butane	-	3	X	2	1
Propane	-	1	-	2	1
Water, Fresh	1	1	1	3	1
Mineral Oils	X	1	3	2	1

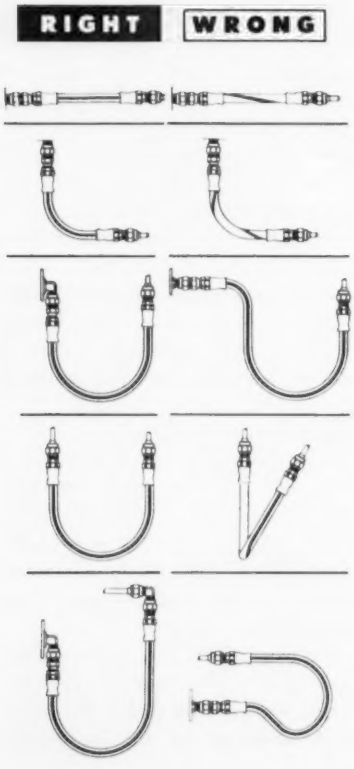
Resistance Ratings: 1 Good, 2 Fair, 3 Depends on conditions, X Unsuitable

type is their somewhat lower original cost. Ends are attached at the factory or in some distributor shops in a hydraulic press. A cutting and skiving unit prepares the hose and permanent, uniform attachment is made.

Where needs for certain type and lengths of hose are known to exist, inventory can be limited to suitable amounts of these pre-assembled hoses. However, as the required variety increases and the capability of making up replacement hoses in the field becomes important, bulk hose and reusable ends can become the most practical solution.

Here, it becomes vital that the right hose and the right ends are used in the assembly. Hose ends are made to match both the size (ID and OD) and pressure capabilities of the hose. Use of low-pressure ends on high-pressure hose is asking for trouble.

Hose ends have to fit into or onto something so a variety of types are made to suit the particular job. They come with male and female ends, with or without swiveling features, straight or as elbow. They are threaded and shaped to match all common connectors—pipe threads, Ermeto or SAE types. Apart from selecting the proper type for connection, the type of fitting selected will depend on the installation.



Do's and don't for installation . . .

Hoses are principally used to provide flexible connection so some movement and vibration is expected. Even when properly selected, improper installation can shorten the hose's life. Common mistakes and correct procedures are illustrated.

Note that the faults all relate to either twisting, movement in two planes or the way that the weight of the hose is supported on the ends. The first two relate to unreasonable stressing of the reinforcing braid as well as other hose materials. Where the weight of the hose is pulling at right angles to the end, a strain is placed on one side of the joint. The tendency is to form an excessively short radius, not only tending to limit flexibility and injure the hose but to pull out the joint. Severe strains can be developed.

Bending radius must be considered. A rule-of-thumb is that the minimum radius should be at least five times the hose OD. When ever possible, high-pressure hoses with their layers of reinforcing braid should be given more radius than low-pressure types.

The illustration shows the effects of installation on hose end selection. From the wide variety available, select the types to suit the functional and space requirements, plus those giving the hose a break.

Summarizing . . .

Pick the right hose for the job baring in mind the suitability of the hose materials, both inner tube and covering, to live with the fluid being handled. In this, consider the fluid's temperature. Then be sure that the hose will handle the fluid's working pressure.

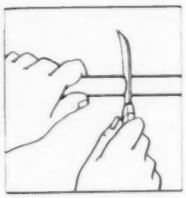
Make sure hose ends match the type of hose; no low-pressure ends on high-pressure hose. Obviously, you'll have to get the sizes and threads that make up to the equipment being connected. Other end characteristic should be picked with the installation in mind to get the cleanest, smoothest run possible.

Figure the installation to avoid hose twisting, inadequate bend radii, considerable movement in two planes, and don't let the hose weight pull laterally on the end fitting.

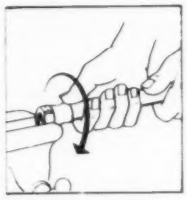
The wide variety of hoses and ends means that you can pick the right combination for practically any job using the factors mentioned as a guide. Install it properly and you'll be pleasantly surprised at the hose assembly's long life.

Reusable hose and assembly instructions for one type of medium pressure hose (H-69)

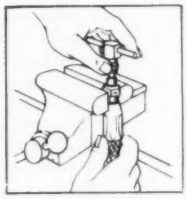
1. Cut hose to correct length. To obtain correct length, subtract "cut-off-factor" for each end from overall length.



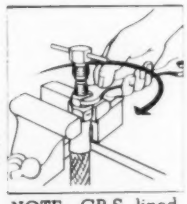
2. Screw hose into body (left hand thread until hose barely bottoms.



3. Place insert on mandrel until flush with bottom of mandrel. Work assembled hose and body into mandrel and insert (lubricate mandrel, insert and I.D. of hose for ease of assembly.



4. Turn until insert is flush with body, but do not exert pressure after this point. Do not be "heavy handed" in screwing down insert tight to body. Ease it down and do not tighten after it touches.



NOTE: GR-S lined hose should not be lubricated with oil.

ADVANCED DESIGN PISTONS

By GILLETT AND EATON

for Longer Heavy Duty Service

TROUBLE-FREE with thousands in use

★ Low initial cost ★ Low cost per mile

★ Amazing increase in piston life

★ Maintains new engine power and performance

G and E WIRE INSERTS PUT CAST IRON WEAR IN TOP RING GROOVE

G and E Wire Insert Piston before machining (left) and after ring grooves are cut (right) showing how the steel wire forms a tough wear-resisting surface on both faces of top ring groove. The patented ferrous plug molded in the head (for diesel pistons) prevents burning through head and lengthens diesel piston life!

With the thousands of G and E "Wire Insert" Pistons in use for periods up to 3 years—a phenomenal record for trouble-free operation has been established. The "Wire Insert" greatly reduces top ring groove wear and increases piston life.

The "Wire Insert" piston design—exclusive with G and E—combines all the advantages of aluminum alloy pistons with the long life of steel in the top ring groove lands. No noticeable increase in weight—unequalled for rapid heat flow—and at low cost.

A pre-shaped steel wire is cast into the piston where the top ring is located. When the grooves are machined, the closely spaced wire surfaces form hard bearing areas on top and bottom faces of the groove. Result—reduced ring land wear, longer piston life at lower cost.

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VANASIL*

"OIL-ABSORBING" PISTONS FOR GASOLINE AND DIESEL ENGINES

*Gillett & Eaton's trademark for a Hyper-eutectic silicon aluminum alloy

VANASIL Pistons have repeatedly run way over 200,000 miles with only .002" to .005" wear on the top ring grooves. On-the-road ring breakdowns caused by badly worn grooves are almost eliminated because *Vanasil Pistons reduce top ring groove wear up to 75%!* Nothing else compares with the genuine G & E Vanasil—the original Hyper-eutectic silicon alloy, proven by 19 years of use.

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GENUINE VANASIL PISTONS

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1. LIGHT WEIGHT—Same as other aluminum alloys.
2. SCORING, SCUFFING MINIMIZED—Because of "Oil Absorbing" microscopic porous texture.
3. LONGER LIFE—30% less friction—30% harder. Greater "hot strength"—see chart at right.
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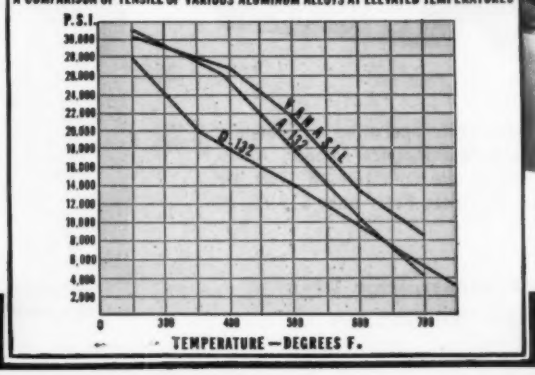
A COMPARISON OF TENSILE OF VARIOUS ALUMINUM ALLOYS AT ELEVATED TEMPERATURES



Write for complete information and prices on Gillett and Eaton's Wire Insert and Vanasil longer lived pistons.

"Our 91st Year"

GILLETT and EATON, Inc. 846 DOUGHTY STREET LAKE CITY, MINNESOTA

Chrysler adds diesels

Part of extensive Deutz production facilities in Germany.

THROUGH a recently announced agreement, Chrysler Corporation will add diesel engines to its marine and industrial engine division line.

Chrysler announced that an agreement had been made with Klockner-Humboldt-Deutz, German engine builder, and its subsidiary, Diesel Energy Corporation of New York.

Deutz air-cooled diesels range in horsepower from 9 to 300. Deutz design provides for interchangeability of parts and a service and maintenance program with comparatively low inventories. Sixteen basic models are in the group. Deutz produces about 60,000 engines a year, making them one of the biggest producers in the world.

Chrysler reports that the engines will be available for across-the-board installations. Sales will be through Chrysler's existing industrial sales outlets and will continue through Diesel Energy Corporation. Parts and service will be readily available.

Chrysler-Deutz agreement is still another sign that the industry is preparing for an unparalleled drive to expand the use of diesels into the light vehicle field.

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MAINTENANCE MINDER

You can be sure of efficiently operating air cleaners when you use the new Maintenance Minder. A 40-second connection shows the condition of your air cleaners **at a glance.** Complete Kit — only $19.75, at your dealer.

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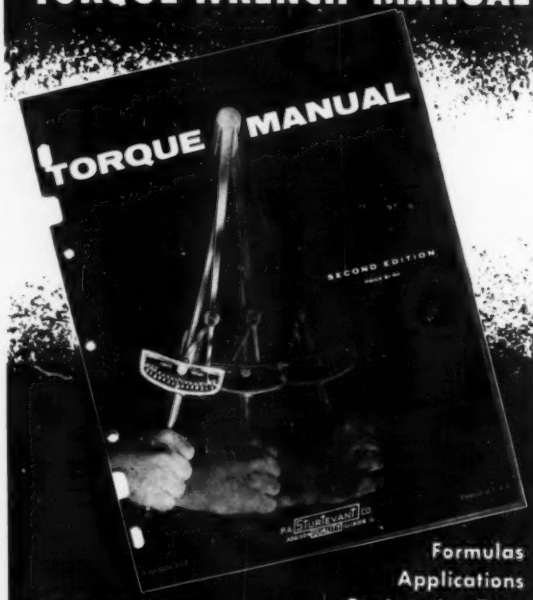
"TORQUE WRENCH" MANUAL



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General Principles

P.A. STURTEVANT CO.
ADDISON QUALITY ILLINOIS

Manufacturers of over 85% of the torque wrenches used in industry

Purolator saves money for Material Service Corporation

About a year ago oil bath air filters were removed from a number of trucks and compressors operated by the Material Service Corporation, Lyons, Ill. They were replaced with Purolator Dry Type Air Filters.

Once a week, thereafter units were inspected, checked with manometer gauge and results logged. Two months after installation, elements were removed for the first time, cleaned and put back into service.

For the Material Service Corporation, the result was clear-cut proof that vehicles equipped with Purolator Dry Type Air Filters could be operated over periods of 6 to 8 weeks without element servicing; that dry-type air filters could be used up to three months without element replacement; *"that savings up to $1000 per year per truck could be effected."*

Results on the compressors were equally as good, bearing in mind that the compressors were run on a tighter 24-hours-a-day schedule.

None of this is surprising. With Purolator Dry Type Air Filters all of the air must pass through the filter before reaching the engine. What's more, unlike oil-bath filters which depend on engine speed for peak performance, dry-type filters work at maximum efficiency regardless of engine speed. In fact, they gain in efficiency as the dirt load increases.

This positive protection extends periods between overhauls, helps prevent major repairs and wasteful down time. Maintenance expenses are lower, too. Low initial cost, re-use, easy changing assure this.

There are Purolator Dry Type Air Filters for all makes of trucks and industrial engines.

For complete information, send for a free catalog, or call your nearby Purolator Supplier.

FOR MAXIMUM ENGINE PROTECTION

PUROLATOR

"Purolator," Reg. U. S. Pat. Off.

Oil, Air & Fuel Filters

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Yes, I want more information about dry-type filtration for fleets.

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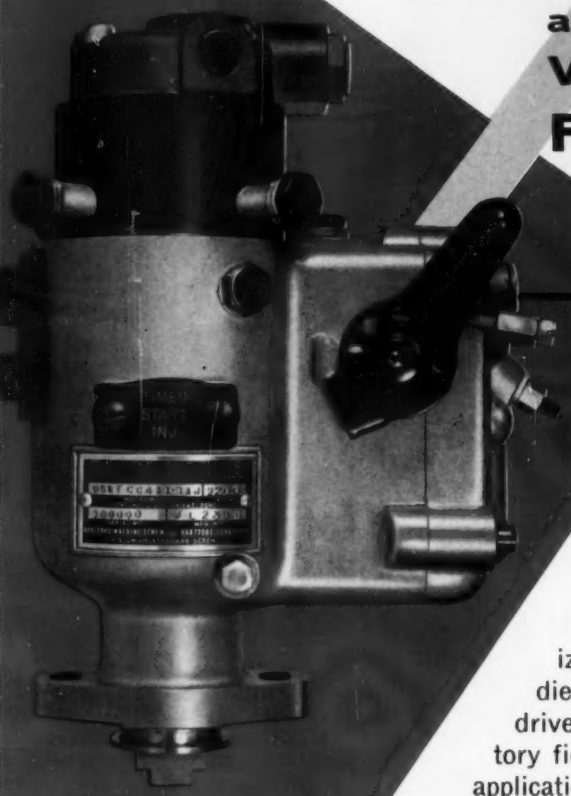
More than 40,000 DIESEL ENGINES

are equipped with VERTICALLY driven ROOSA MASTER fuel injection pumps



The vertical pump drive arrangement, pioneered by Hartford Machine Screw Company, is a revolutionary and exclusive ROOSA MASTER feature. The vertical adaptability has saved manufacturers thousands of tooling expense dollars by permitting standardization of engine blocks for gasoline and diesel engines. More than 40,000 vertically driven ROOSA MASTER pumps in satisfactory field service are proving that the vertical application to existing and new engine designs is practical and sound.

VERTICAL DRIVE ADVANTAGES

- Simplicity of installation
- Lower cost
- Shorter injection lines for better performance
- Easy accessibility
- Makes available space for other accessories

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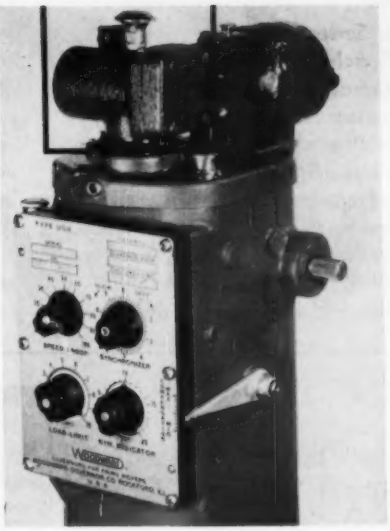
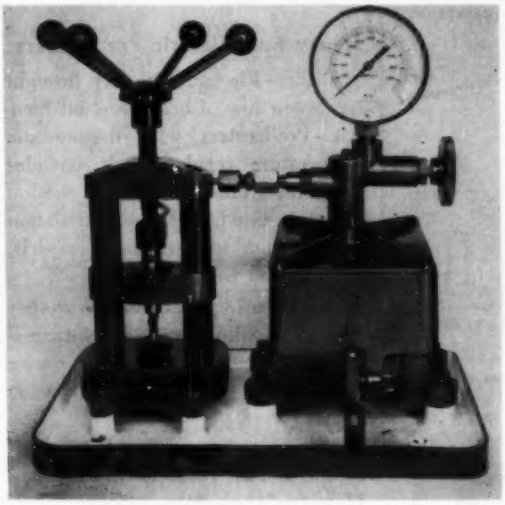
You can depend on the diesel that depends on ROOSA MASTER

diesel power >> new products

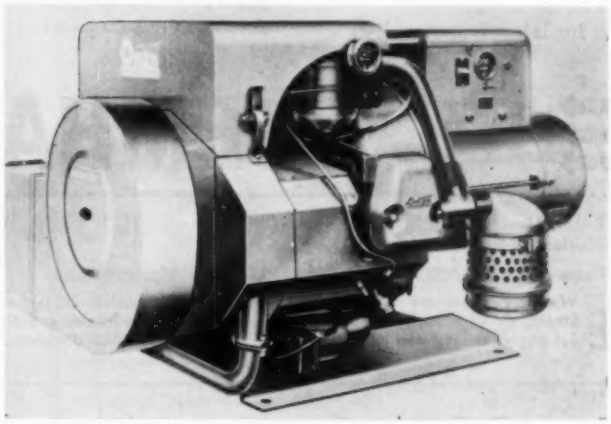


Woodward's new low lubricating oil pressure shutdown device has been developed for Woodward UG8 and UG32 hydraulic governors. It is a positive-acting hydraulic device that can reduce linkage and simplify installation and maintenance. New device is interchangeable with the standard UG8 and UG32 solenoid shutdown. Lubrication oil shutdown is mounted on the governor cover in the same place as the solenoid shutdown and operates on the governor strap. A manual reset knob must be lifted when starting and before oil pressure has been built up. Shutdown pressure is adjustable from 6 psi minimum to 26 psi maximum by means of an adjusting plug. Pressure required to disengage the manual reset latch ranges from 11 psi to 35 psi depending on the shutdown pressure setting.



Morris & Ingram, English manufacturer has a new Diesel Pumping Unit Comparator of interest. Shown here connected to their Simplex Injector Test Pump, it can be used with other makes of pumps where the delivery valve allows no leak-back. Barrel and plunger assembly are held in a swinging arm between upright members. Plunger is held in any position in the pump barrel by an adjustable supporting pad. Adapter rings are supplied to hold various size barrels. An adaptor with a fuel supply line has a pressure pad which makes a metal-to-metal seal with pump barrel. In operation, after barrel and plunger assembly have been mounted, plunger is turned to required position and supported by the adjustable pad. Pressure is applied and rate of leakage accurately timed and compared with known standards. Special advantages are the ability to position plunger anywhere in the stroke to check condition of the helix as well as of the top face of the plunger.

Onan & Sons is offering a new 6-kw aircooled diesel electric generating plant with some important design changes. Model 6DRN can be used in broad general electric power applications. Moreover, its new vacuum cooling system makes it adaptable to below-deck marine applications. Unit is powered by a new 13.5-hp 4-cyl diesel. New distributor fuel injection pump is said to provide exceptionally smooth operation. Compression ratio of all DRN engines is the same. Separate cylinders are replaceable when worn with standard bore size cylinders. Generator and control units are Onan-built. Self-excited generator is direct connected to the engine by a semi-flexible drive disc.



MORE NEW PRODUCTS FOLLOW ►

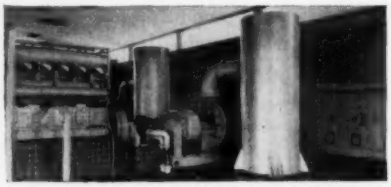
NEW PRODUCTS . . .

New Series of Synchro-Start Automatic Engine Controls

Engines equipped with Synchro-Start Products' new automatic control sets can be started or stopped from remote pilot devices such as pressure switches, float switches, power failure relays, etc., and are completely automatic in operation.

Enclosed in a steel, dust-proof cabinet, controls feature overload breakers and plug-in relays. Overload breakers eliminate the need for fuses. Plug-in relays simplify what little field maintenance older models required. Additionally, cushion pressure is brought into play when the cover of the cabinet is closed. Relays are positively locked in their sockets and cannot be vibrated loose.

A bulletin is avalable giving complete information on these latest controls.



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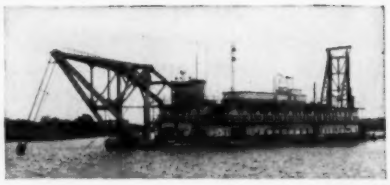
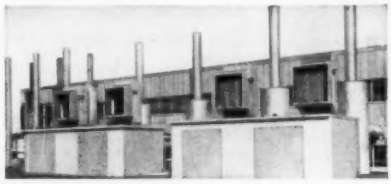


MARINE ENGINES



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EMHART

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☐ Internal combustion exhaust and intake
☐ Air compressor intakes and discharges
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Easy Replacement Feature of New V-Band Coupling

Replacement of V-Band couplings on engine exhaust connections, or other cylindrical structures, is made simple by a new V-Band coupling from Voss Engineering.

New type latch mechanism does the trick. It takes a standard replacement hex-head bolt instead of the usual T-bolt welded into the assembly. No need to replace the whole assembly when nut and bolt freeze. Simply cut the bolt, knock it out and replace with another standard hex-head bolt.

Coupling from Voss has a barrel trunion with a milled slot so hex-head bolt doesn't turn as nut is tightened. Bolt will not drop out during assembly.

Heavy Fuel Electric Pre-Heaters

Valcan Electric Co. has brought out a new line of heavy fuel oil Electric Pre-Heaters with thermostatic temperature regulation. It includes low-density tail piece heaters, suction or return line heaters and circulation heaters in a wide range of models, wattage and voltage ratings.

Plants using residual or other heavy fuel will want all the information on these units. Mark the reader service card accordingly for your copy.

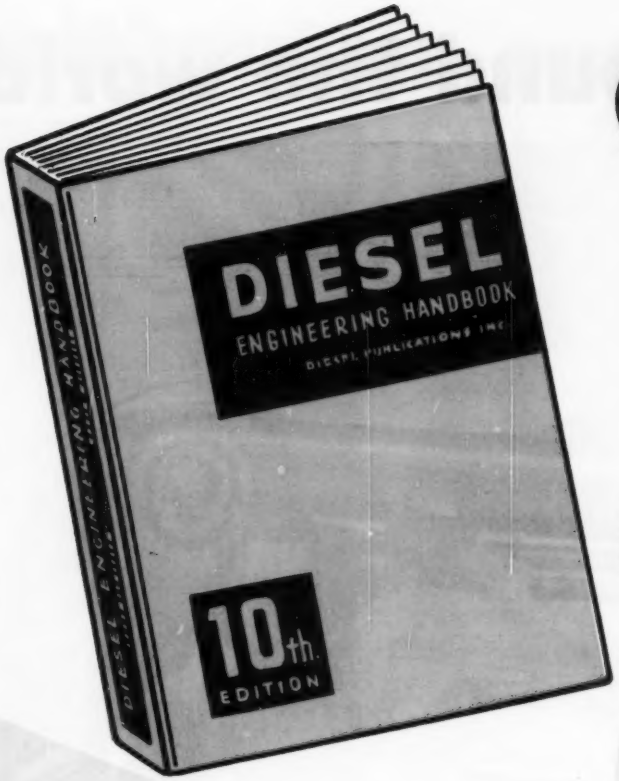
Allied Metal Hose Introduces New In-Stock Plan

Faster delivery to the user is aim of recently introduced "in-stock" plan for Allied Metal Hose line of standard "MNH" Flexible Metal Hose Connectors. User may now select from a wide range of "off-the-shelf" stock connectors which, previously, were custom-built from individual specs.

ALLFLEX "MNH" Flexible Connectors are available in stainless steel, bronze and monel. They are designed to master pipeline problems caused by rigid connections.

Stocked by local Industrial Distributors, new line is also ready for same-day shipment from the factory.

(More New Products on Page 62)



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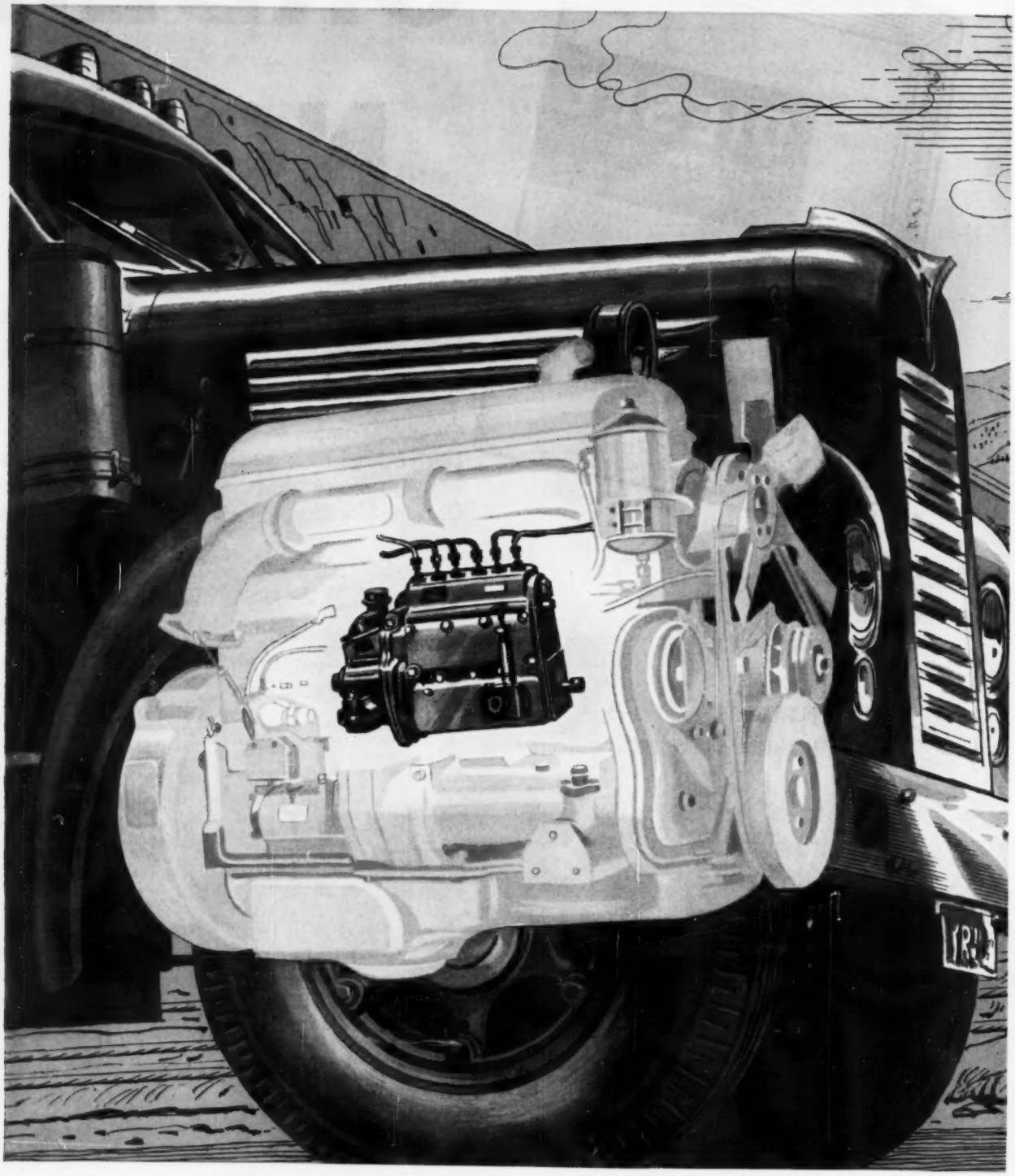
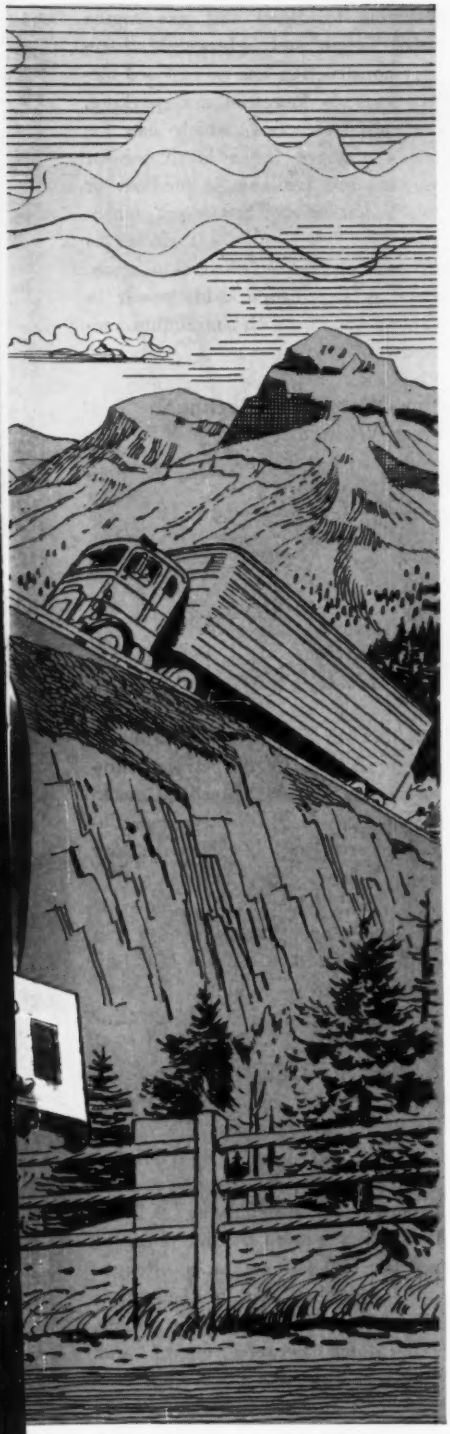


...and AMERICAN BOSCH IS

without an overhaul!



Seven hundred thousand miles of heavy duty hauling—equivalent to 28 times around the world—without a major engine job! Two major trucking lines report that diesels equipped with American Bosch fuel-injection systems have rolled up this remarkable mileage.

Wherever diesels move, they move with American Bosch fuel-injection systems—systems that feed exactly the right metered amount of fuel, with split-second precision, thousands of times per minute. American Bosch is the largest independent producer of diesel fuel-injection systems in the Nation.

American Bosch fuel-injection systems are used as original equipment by the following diesel manufacturers: Mack, Allis-Chalmers, Alco, International Harvester, J. I. Case, Waukesha, John Deere, Minneapolis-Moline, Continental, Hercules, Dominion Engineering, White, Worthington, Cooper-Bessemer, Nordberg, Oliver, Chicago Pneumatic, Baldwin-Lima-Hamilton, American Marc, Witte, Fairbanks-Morse and many others.

Fuel-injection systems are only one of many important industrial, consumer and defense products made by American Bosch: hydraulic starting systems, actuating motors, pulse generators, magnetos, windshield wipers and many more. American Bosch, Springfield, Massachusetts, a division of American Bosch Arma Corporation. 6748

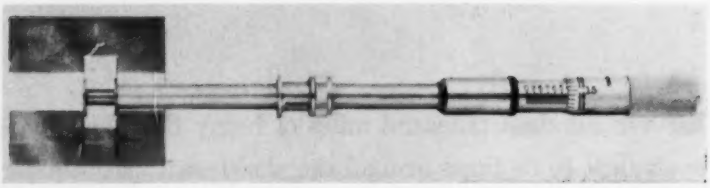
AMERICAN BOSCH ARMA
CORPORATION

THE HEART OF THE PICTURE

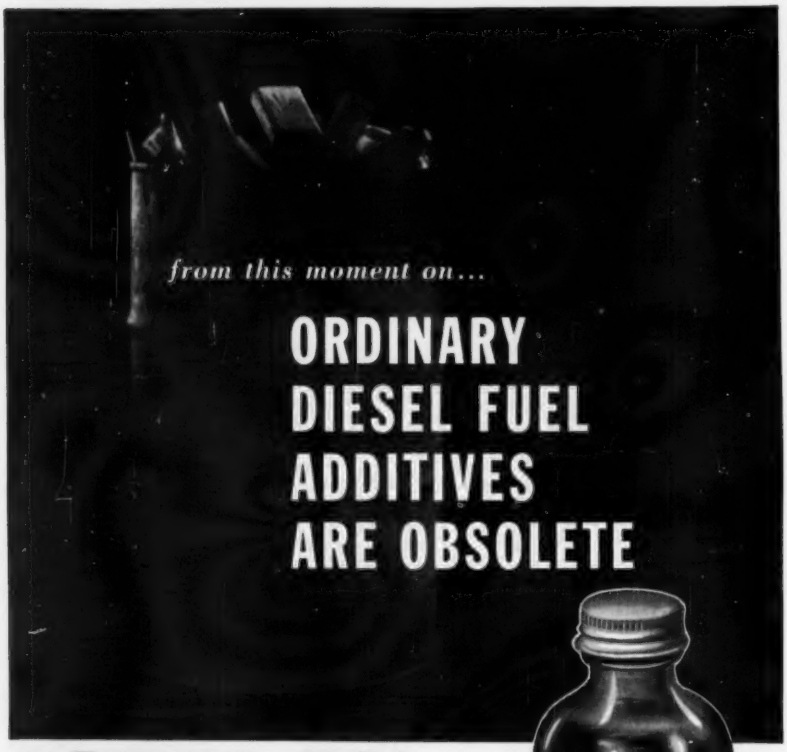
NEW PRODUCTS . . .

(*Continued from Page 58*)

"Multi-Mike"



This internal micrometer measures cylinder groove and land widths, O-ring widths, groove and keyway locations. Measurements accurte to 0.0005-in. are possible from 0.050-in. to 1.050-in. for groove widths, from 0 to 1.000-in. for lands and distances between grooves. Current model of the Multi-Mike will locate from an external reference to its probe depth of 5¾-in. Manufacturer is Navan Products, Inc.



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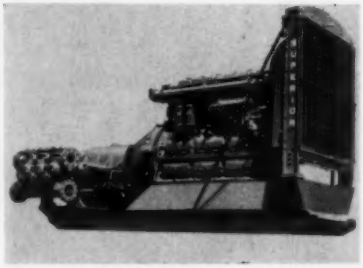
Proto's Soft-Face Mechanic's Hammer

This tool has a number of interesting features that should make it valuable to diesel and gas engine men. Tough and light-weight, hammer construction has no exposed metal parts, is therefore non-sparking.

Replaceable tips which can be easily changed for a given job or surface, are available in medium or tough hardness. They won't mushroom or flake and are resistant to grease, oil, gas and common acids. Head is shot-loaded, adds power to driving force with minimum rebound.

New-Waterflood Package From White



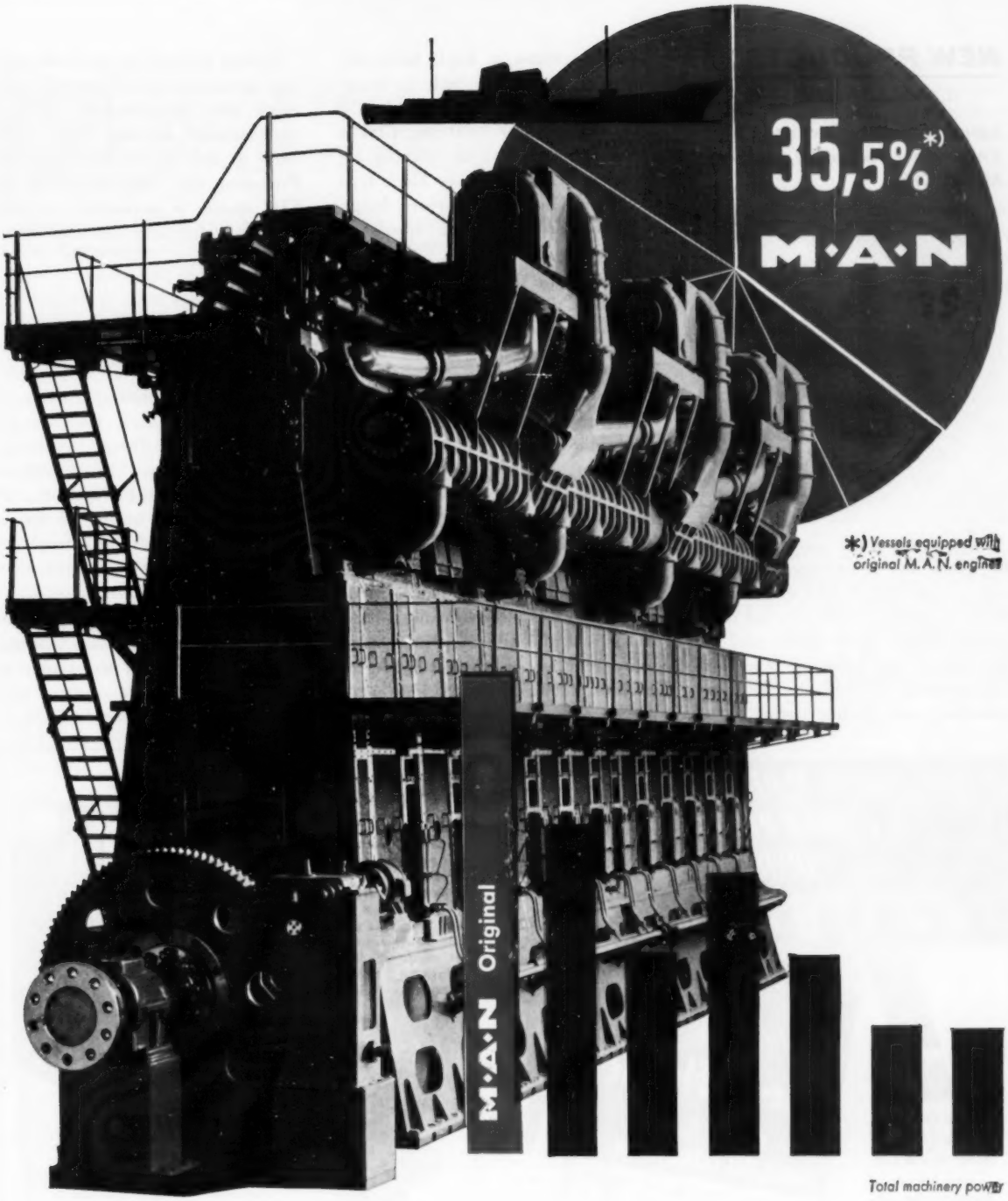
White Diesel Engine Division is now marketing to the petroleum industry a complete waterflood package of diesel engine and pump. Capacity is up to 23,600 barrels per 24 hour day.

Engine is a 4-cycle, 6-cyl Superior G-510 that operates on natural gas or propane within the 190-400 bhp range. Improved combustion chamber with greater piston thrust provides high compression good fuel economy. It is the lowest cost-per-horsepower-hour of any gas engine in its field, according to White.

Pump, an "Oilwell" 368-P Triplex is directly connected to the engine through a flexible coupling. It operates with 5½-in to 6½-in. plungers over the 600-840 psi range. Reduction is handled within the pump eliminating need for an intermediate gear. Match between engine and pump is reportedly good.

White is offering a choice of automatic starting, remote controls or any tailored control desired for this application.

(*More New Products on Page 64*)



214 vessels of over 2000 tdw were equipped in 1958 with Diesels built in the shops of the seven major manufacturers of large Marine Diesel Engines, totalling 1,222,590 BHP. 76 of these installations were furnished with Diesel engines built in the Augsburg and Hamburg Works of M. A. N., which constitutes a share of over 35%. In all, 630 motorships of over 2000 tdw were completed, of which 140 vessels were fitted with engines built by M. A. N. and its licensees. *(Statistics from „The Motor Ship", January 1959)*

MASCHINENFABRIK AUGSBURG-NÜRNBERG AG · AUGSBURG
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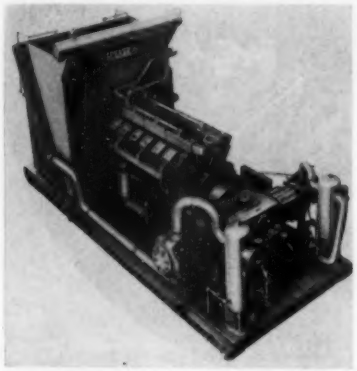
NEW PRODUCTS . . .

(*Continued from Page 62*)

Larger Capacity Packaged Field Compressor Added by Clark—Model CFB



Model CFB is the new addition to the Clark line of packaged compressors for gas and oil field applications. It is a completely self-contained compressor station which can be used for gas lifting, gas boosting, repressuring, pressure maintenance, field gas gathering and pipeline testing.

Unit features a 2-cyl, balanced/opposed compressor built in horsepower sizes ranging from 200 to 350 bhp. Operating at 1000-rpm, CFB is direct connected to the driving engine by a simple rubber block type coupling. Engine is of proven design with conservative piston speeds to assure long life.

Built with a single unitized vertical air flow radiator, all components are mounted on a rigid steel skid which is easily transportable.

Compudyne Surge Control System

Of interest to operators of gas compressors is a new packaged surge control system intended to permit safe operation of large compressors closer to the surge point for increased output. Made by CDC Control Services, Inc., this fast-responding control is said to improve operating stability, reduces power consumption in addition to safely increasing compressor output.

System consists of electronic sensing, measurement and control instruments, plus electro-hydraulic or electro-pneumatic actuator and control valve as the final control elements. Pre-tested and field-adjustable, the CDC system is guaranteed to fulfill specific performance specifications.

OTC Vanguard—New, Two-Stage High Pressure Hydraulic Pump

Precision Hydraulics Division of the Owantonna Tool Co. has announced a new 2-stage hydraulic pump. Unit delivers from 600 cu in./min. at 100 psi to 50 cu in./min at 10,000 psi. It weighs 45 lbs, is precision built and looks ideal for testing hydraulic systems and components.

Vanguard should find application in design of high pressure systems, production lines and test stands as well as maintenance equipment such as hydraulic shop presses and pullers.

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diesel power >>> new literature

Catalog on WIX Oil and Air Filter Cartridges

Broad coverage of replacement cartridges for diesel engines in heavy construction equipment makes this new, color-coded, master catalog from Wix worth having. It covers the entire Wix line of filters for cars, trucks, buses, tractors, marine and stationary engines. Use of colored page edges makes it an easy to use reference book you'll want to have.

Diesel Fork Lifts Cut Costs

Material handling costs can be cut with diesel fork lifts. You can get the story in three new pieces of literature from Allis Chalmers. Here are specs on the entire line of lift trucks made by this firm. Detailed are engineering features, load charts and dimensions. These are illustrations of most models.

New Opportunity for Farmers and Contractors

Thought about putting your diesel equipment to work in soil and water conservation? A publication from Allis-Chalmers tells contractors who to contact to find out what's doing in your area—what you can do in this growing field. Opportunities for farmers in this important work are also covered. Find out about soil and water conservation by asking for "New Opportunities in Soil and Water Conservation" on the reader service card.

Applications for Sunnen's Precision Honing Machine Outlined

Newly revised bulletin from Sunnen Products Company tells the application story of the Sunnen Honing Machine in production, maintenance and tool room work. Sunnen states that the working range of their equipment now covers hole diameters from 0.100-in. to 2.625-in. with tooling available from stock and to 4½-in. with tooling built to order. With the importance of today's tolerances and finishes, more and more shops are finding the need for honing equipment. Sunnen's bulletin should be in your file.

Oil and Gas Engine Power Costs

The 1958 Report on Oil and Gas Engine Power Costs (data for 1957 and previous years) has been published by the American Society of Mechanical Engineers. The price is $3.00 per copy with a 20% discount for ASME members. For anyone in the business of planning, or operating power facilities, this report will serve as an excellent yardstick for figuring the economies of diesel operation. It ranks as one of the most important publications available to the power field.

(More New Literature on Page 67)

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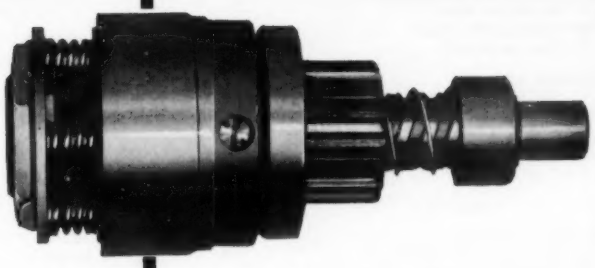
BENDIX STARTER DRIVES



In starter drives BENDIX means QUALITY. That fact, accepted by automotive men for almost half a century, is just as well-known to diesel engineers today. That's why the Bendix* Starter Drive is standard equipment on more diesel engines than any other make. It can be mounted more easily and in more positions. It requires no actuating linkage—the solenoid can be placed in any convenient position. It is simple in design, has fewer parts, needs fewer adjustments. No matter what your type of diesel, you'll be wise to specify and demand the Bendix Starter Drive for outstanding performance and economy. *REG. U.S. PAT. OFF.

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G—Governors T—Specialized Tooling & Test Equip. E—Electrical Equipment

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G T E Tel: WOodland 4-5273

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DIESEL CONTROL CORPORATION
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F A C Wilmington, California
G T Tel: TErminal 4-8516

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T E Tel: JA 5-3481

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G T E Tel: STate 7-6746

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F A C Miami 42, Florida
G T Tel: NEwton 4-3063

FLORIDA DIESEL & ELECTRIC CO.
1930 No. Miami Avenue
F A G Miami 32, Florida
T E Tel: FRanklin 1-7691

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AUTO ELECTRIC & MAGNETO COMPANY
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F A G Atlanta 8, Georgia
T E Tel: JAckson 3-5831

ILLINOIS

ILLINOIS AUTO ELECTRIC CO.
2011-37 Indiana Ave.
F A C Chicago 16, Ill.
G T E Tel: CA 5-4444

KENTUCKY

DIESEL INJECTION SERVICE CO.
805 Mulberry St.
F A C Louisville 17, Ky.
G T E Tel: MElrose 5-7731

LOUISIANA

WOMACK BROTHERS DIESEL SERVICE
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F A C Baton Rouge, Louisiana
G T E Tel: ELgin 7-9666

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605 West First Street
F Bossier City, La.
Tel: 5-7404

GERHARDT'S INC.
1917 Jefferson Highway
F A G New Orleans 21, La.
T Tel: VErnon 3-7254

JOHN M. WALTON, INC.
1050 Carondelet Street
F A C New Orleans 13, La.
G T E Tel: JAckson 5-0556

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997 Congress Street
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Tel: SPruce 3-1082

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F A G Baltimore 18, Md.
T Tel: Tux 9-7607

PARKS & HULL AUTOMOTIVE CORP.
1033 Cathedral Street
F A G Baltimore 1, Md.
T E Tel: SA 7-8383

MASSACHUSETTS

BOSTON FUEL INJECTION & ENGINE SERVICE CO., INC.
263 Northern Avenue
F A G Boston, Mass.
T Tel: Liberty 2-6646

W. J. CONNELL COMPANY
210 Needham Street
F A G N. Upper Falls 64, Mass.
T E Tel: DEcatur 2-3630

C. A. KROHNE & SONS
833 Columbus Avenue
F A C Springfield 5, Mass.
G T E Tel: RE 2-7441

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For information contact:
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T G E Tel: DU 9-7296 & DU 9-7297

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226 North Marine Avenue
Wilmington, California

UNITED STATES AVIEX CO.
423 North 9th Street
Niles, Michigan

NEW LITERATURE

(*Continued from Page 65*)

Westinghouse's Convenient Tables And Formulas Booklet Available

This little booklet is jammed full of convenient tables, formulas, graphical symbols, electrical data, properties of materials, heat transfer and steam information, measurements and other subjects. Priced at fifty cents, it is available from Westinghouse. While heavy on the electrical side, it contains a wealth of useful information for maintenance personnel. This is one you'll want to keep in your hip pocket for ready reference. Mark the reader service card for information on how to get your copy.

Interested in Logging or Conservation Contracting?

Two publications available from Allis-Chalmers are packed with information on these two areas of particular interest to our industry.

TIMBER TOPICS is a quarterly tabloid with lots of info on the logging industry. Names in the news, pictures and business tips fill the 12 pages of this publication.

THE REPORTER tells the story of the future of The Watershed Program, and where the contractor fits into the picture. This issue of the Reporter on a vital subject is of special interest. It could mean new business for contractors.

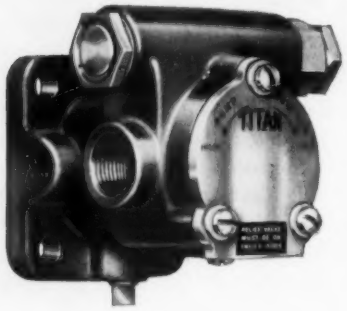
Allis-Chalmers Latest, Improved Engines Described

Catalog BU-540 tells of the design, construction and mechanical advantages of Allis-Chalmers new, direct injection engines, the 21000 and 16000 diesels. This 16-page booklet features illustrations, charts, graphs and cut-a-way engine views. Of particular interest is a full run-down on A-C's new combustion system.

Also available is a four-page report on the operating and mechanical advantages of the 21000 engine as the power plant for the A-C HD-21 crawler tractor. This is an excellent description of a powerful new unit for high-yardage earthmoving.

(*More New Literature on Page 68*)

BILLION MILE CHAMP



Typical Diesel Pump

Series 5501. Rated capacity: 200 gph. Discharge pressure range up to 20 psi. 11-tooth spline or ¼" square drive tang; rotatable or square mounting flange. Weight with fixed pressure type relief valve: 1.8 lbs.

TITAN
Positive Displacement *Rotary* Fuel Pumps

Among the horsepower "heavyweights" where fuel economy is dollar-and-cents business, TITAN FUEL PUMPS have hung up a performance record hard to beat. Specified as *original equipment* on hundreds of thousands of aircraft, trucks, buses and stationary diesels, Titan Pumps have accounted for billions of low-cost, trouble-free payload miles. High quality is one reason. Another is proven, simple, low-maintenance design. For a convincing pump demonstration call us — or write your engine manufacturer.

TITAN PUMPS ARE PRECISION BUILT BY PRECISIONEERS

TITAN PUMP AND ENGINEERING CORP.
Novi, Michigan

Pumps for any Engine Design • Most Fuels • And a Variety of Engine Mounting and Drive Conditions

NEW LITERATURE

(*Continued from Page 67*)

Bulletin on Sunnen Honing Machine

Applications in production, maintenance and tool room work are discussed in a new bulletin on Sunnen's Honing Machine.

Working range of the Sunnen machine now covers hole diameters from 0.100-in through 2.625-in. with tooling available from stock—to 4.5-in. with tooling built to order.

Life of Your Engine Depends On the Records You Keep

Caterpillar's Engine Division has come up with an Engine Log Book that operators of diesel engines will find really valuable.

Its simplicity is the key. Essential information is recorded for 13 months of operation. It contains space for daily entries on fuel and lube oil consumption, parts, service, repairs, etc. Monthly entries may be transferred to a twelve-month summary sheet. Easy to keep, this booklet is the answer to many operator's gripes about complex record keeping.

Cat's Engine Log Book is available at no cost. With the importance of record keeping in mind, this is a must item for your operation.

Want Information on Trend To Air Motor Starting?

Ingersoll-Rand has produced a 24-page bulletin on the growing trend toward cranking internal combustion engines with air power.

Here are case histories on air starting motor installations and information on how to select the proper starter. Advantages of these units are detailed.

Also provided are detailed specifications and mounting dimension diagrams for two new Ingersoll-Rand air starting motors.

Interesting feature of the booklet is an 9-page selections list showing the size and model number of the starting motor required for most models of diesel, natural gas, dual-fuel or gasoline engines of 29 leading manufacturers.

Latest Edition of White's Driver Manual Available

White Motor Company has released the latest edition of their Driver's Manual for truck owners, fleet superintendents and drivers.

This 158-page manual is a compilation of authoritative motor truck data designed to help drivers conserve the equipment and keep it operative. Information is based on experience of thousands of successful drivers plus the knowledge of factory and field engineers, fleet supervisors and other motor truck authorities.

Contents include sections on correct preparation, starting, taking-off, road practices, parking and care plus reference data on cooling systems, electrical accessory loads, weights of commodities, etc.

This booklet sells for $1.25, the actual producton cost. Address the Sales Promotion Department, The White Motor Company, 842 E. 79th St., Cleveland, Ohio. There is no mailing charge. We'd appreciate it if you'd say you read about it in Diesel Power.

New Spec Sheets From Allis-Chalmers

Three new specification sheets on the Model Forty Five Motor Grader, HD-16 and HD-16 DC and D diesel-powered crawler tractors have been released by Allis-Chalmers.

These well-designed, easy-to-read data sheets feature cutaway views with marginal notes providing ready reference to the various components. If you are interested in heavy equipment these are a must for your file.

Clark's Packaged Field Compression Line

Two publications from Clark detail the firm's new CFA and CFB Packaged Field Compressors.

CFA line includes 2 and 4 compressor cylinder models built in a total of 15 sizes ranging from 100 to 350-bhp.

CFB unit is similar to the bal-

anced/opposed, direct-coupled CFA series. It is designed for single or two stage applications when greater horsepower is required in a 2-cyl machine. Extra heavy construction throughout is a feature of this field compressor.

Both bulletins are available free through our reader service department.

Radically Different Pressure Gauge Described

The Rochester High Pressure Gauge, a multiple-wound helical coil, bourdon tube-type, incorporating extreme safety features, is a rugged unit with a number of outstanding features. These gauges are designed to stand up under the most severe operating conditions. Simple design affords protection against overpressure and vibration damage. You can get complete details in a 6-page catalog from Rochester Manufacturing Co. The publication contains specifications, photographs and facts on the new Rochester line.

Gulf Offers Lubricant Information to the Mining Industry

Gulf fuels, oils and greases that can be specified for a variety of stationary and motorized equipment used in metallic and non-metallic mining operations, are featured in a new 8-page illustrated booklet from the Gulf Oil Co. It also details Gulf's new Mining Lubricant H.D., a specially formulated semi-fluid lubricant tailored to the needs of the mining industry.

Power Transmission Digest By Dodge

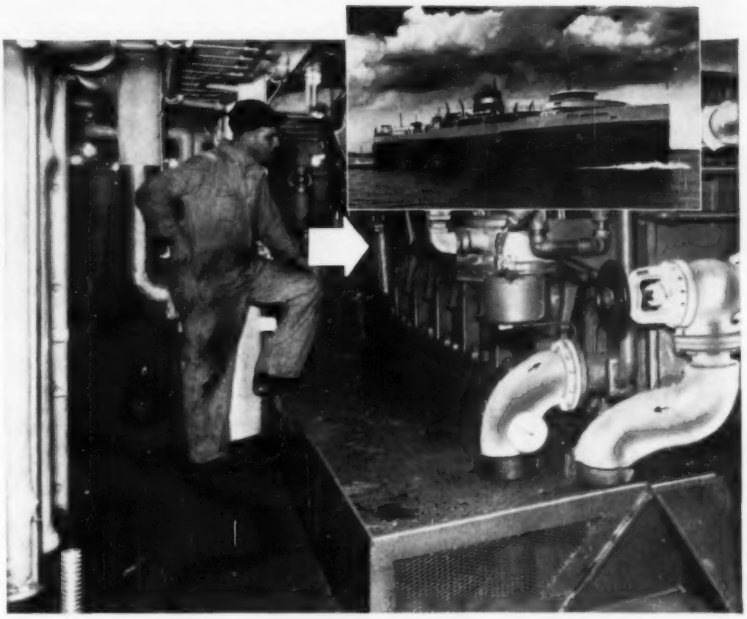
Brief and to the point is the key to this concise bulletin on the Dodge line of power transmission machinery. In just 8-pages these features are detailed: Flexidyne Dry Fluid Drives; Para-flex Flexible Cushion Couplings; Taper-Lock products and the new Dyna-V line of vee-belt drives.

Mention Dodges' Bulletin A-706 on the reader service card for a lot of product information in a compact form.

(*More New Literature on Page* 70)

NUGENT FILTERS

SERVE M/V ARTHUR K. ATKINSON



...first Diesel Railroad Carferry on the Great Lakes

One of the most unique vessels now plying Lake Michigan is the railroad carferry, *M/V Arthur K. Atkinson.* Prior to complete renovation and repowering with Nordberg Diesels, this vessel was the 43 year old, steam powered *Ann Arbor No. 6.*

Nugent Filters, both lube and fuel oil types, are providing 'round-the-clock filtering protection for valuable new engines and allied equipment aboard the *Atkinson.*

For safe, effective filtering protection for all your valuable equipment . . . remember to specify Nugent Fuel and Lube Oil Filters. They are available in a wide range of types and sizes.

WRITE FOR DESCRIPTIVE LITERATURE

ESTABLISHED 1897

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OIL FILTERS • STRAINERS • TELESCOPIC OILERS
OILING AND FILTERING SYSTEMS • OILING DEVICES
SIGHT FEED VALVES • FLOW INDICATORS

NEW LITERATURE

(*Continued from Page 69*)

New Booklet on Cat Motor Graders

Caterpillar has released a new 8-page booklet on the company's three motor graders.

Booklet describes main features of Cat's "Top Performers." The 150-hp No. 14 is cited for its turbocharger, high-clearance moldboard, dry-type air cleaner, oil clutch and other features.

No. 12, 115-hp is detailed as "a favorite for 2 decades." And the 75-hp No. 112 gets a run-down on its low cost against high utility. Economy is the key here.

Bendix T-type In-Line Filters

Bendix Filter Division of Bendix Aviation Corporation has released a new 6-page, 2-color catalog. No. BFD-64. It describes 5 standardized lines of high and low pressure T-type in-line filter assemblies, replacement filter elements, dual bowl filters and differential pressure indicator filter assemblies.

These new filter assemblies and replacement elements, were designed for application in aircraft and missiles, are suitable for use in diesels in a variety of applications. Filtration ratings for equipment detailed range from 2 to 250-microns. Covered are flow ranges from 1- to 24-gpm with Mil-H-5606 and 200 to 2500-scfm with air to 3000-psi.

Anniversary Issue of Cummins Bulletin

Theme of 25th anniversary issue of the Cummins Bulletin is progress. For anyone interested in the diesel industry and its remarkable growth —this should be a collectors item.

Behind the reputation that Cummins has won during their history is the story of American industry . . . the story of men bringing to the country, the products that we so often take for granted.

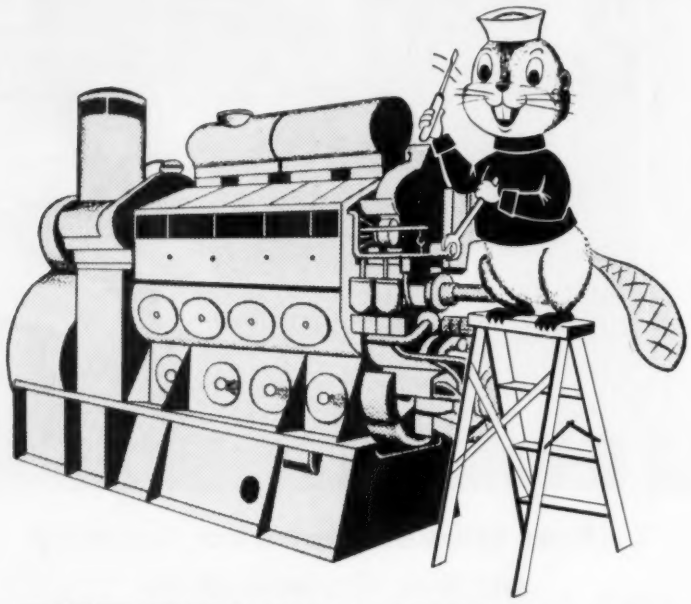
Cummins story is of interest to all the diesel field. Featured are articles on the men who built the company, development of Cummins diesel engines, and the applications in which they proved their worth as a dependable, economic source of power.

Facts About Storage Batteries

That's the title of a neat little booklet from Exide. This should be of use to any user of storage batteries. Packed into 31 pages are some 16 articles on batteries, their care and chemistry. "How-to" is the key to most of them. Booklet is written simply and well. Should be excellent as an instruction manual. Could help in any shop in saving on costs and labor through proper care. Here are a few of the article titles:

Your Tractor Battery—How to get the most from it.

The Electrical System
Battery Chemistry
Battery Construction
How To Do It—Prevent Corrosion
How To Do It—Buy Batteries
How To Do It—Test Batteries
How To Do It—Store Batteries



SAVE TIME AND MONEY... LET NATIONAL MARINE KEEP YOUR DIESEL ENGINES, PUMPS AND COMPRESSORS ON THE JOB!

For annual maintenance and overhaul of your diesel engines, compressors and pumps, count on National Marine. We'll rush trained experts and replacement parts to the scene . . . by air, if necessary. You'll get urgently needed productive equipment back in service with a minimum of down-time, and yearly maintenance costs will stay at rock bottom. Call, write or wire for full information on our maintenance and repair service.

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MEMBER OF THE AMERICAN WATERWAYS OPERATORS, INC.

NEW!

...ON VAN NORMAN 467 CRANKSHAFT GRINDER— *Extra Features* FOR FASTER DIESEL CRANKSHAFT RE-GRINDING

1 A great, new Heavy Duty Grinder at a sensationally new low cost — with a working range previously encompassed only by larger and much more expensive machines. Features constant alignment, vibrationless operation, and faster set-up time. Plus, the added advantage of *new* electrically operated, Variable Speed Table Traverse.

2 The greatest speed of operation ever built into a Crankshaft Grinder . . . NOW — even greater with a *new* Hydraulic Wheel Head Retractor for faster in-feed and retraction. A large capacity Grinder — compact and convenient as a smaller machine.

3 Save time and money with this modern Van Norman Grinder in your shop. A convenient "Pay-As-You-Depreciate Plan" will put this great Grinder to work for you for only a few dollars a day. Get the complete story on this economical No. 467 Crankshaft Grinder—*today!*

Write Van Norman Automotive Equipment Co. Division of Van Norman Industries, Inc., Springfield 7, Mass.

VAN NORMAN PRECISION MACHINING TO THE HIGHEST STANDARDS of ACCURACY

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INSTANTANEOUS POSITIONING OF HEAD OR FOOTSTOCK TO ACCOMMODATE SHAFTS OF ANY LENGTH UP TO 90"

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22" SWING OVER CENTERS

●

UNIT TYPE WHEEL HEAD SPINDLE

●

3 WORKHEAD SPEEDS 20-40-60 RPM

●

BUILT-IN COUNTERWEIGHTS

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PRECISION **VAN NORMAN** MACHINING

QUALITY IS THE REASON *"It Pays to Van Normanize"*

Increased power, lower fuel consumption

THREE NEW GENERAL MOTORS 567 DIESEL ENGINES

New "D" series available in turbo-charged or normally aspirated models

First application for the new "D" engines was announced recently by Electro-Motive for a new and more powerful, more economical line of Diesel locomotives. Four years in development, two of the new engines are turbo-charged, one normally aspirated.

A long list of improvements have been incorporated to give these engines even more stamina, reliability and lower maintenance requirements than their famous long-lived predecessor, the General Motors 567C engine.

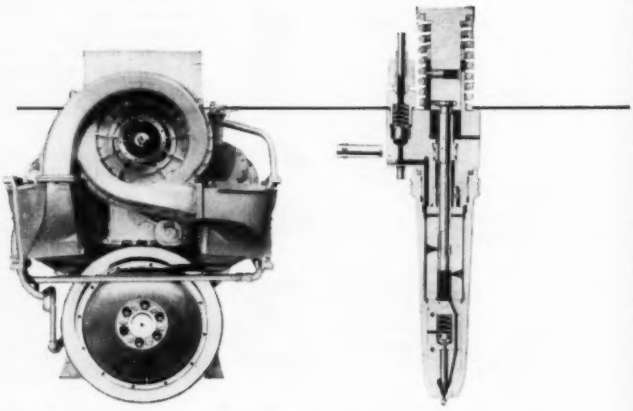
Normally aspirated series

The same fundamental design is used for each engine whether normally aspirated or turbo-charged. As a result, the normally aspirated 567D-1 engine, made to turbo-charged standards, is an engine of outstanding durability and low maintenance. An increase in compression ratio from 16:1 to 20:1 and a new needle-valve injector provide for increased power and fuel economy. Specific fuel consumption at full load is 5 percent less than the previous "C" engine.

Turbo-charged series

The Electro-Motive designed turbo-charger, unlike conventional super-chargers, operates efficiently at low and high engine speeds. This feature is especially important for starting, low load and acceleration. The turbo-charged 567D-2 and 3 engines will not derate over a wide range of altitudes. Under test in actual locomotive service conditions, full engine output was maintained at over 8,000 feet altitude. In addition, the turbo-charged engines reduce specific fuel consumption by as much as 10 percent at full load.

Continual improvement of major components has long been an Electro-Motive policy. These new engines represent more than twenty years of Diesel engine development. They are the finest expression yet of the General Motors 567 series—more powerful, more economical and even more reliable.

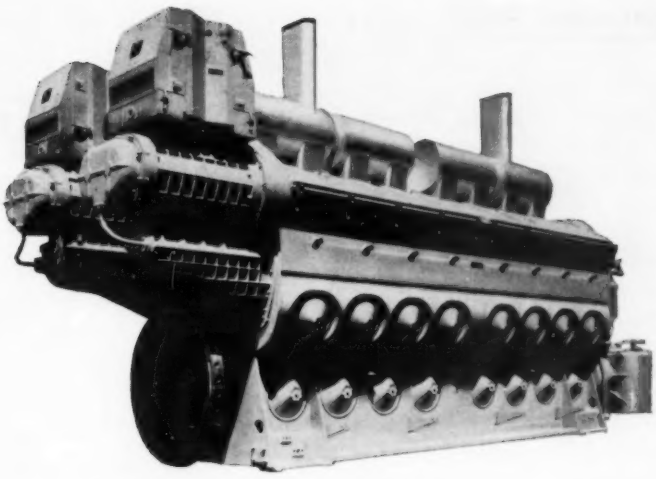


New turbo-charger is Electro-Motive designed and developed. Unit operates from engine gear train at low engine speeds, from exhaust turbine at high speeds. Combination drive provides adequate air supply at all operating levels. Turbo-charger maintains engine output in high altitude operation.

New needle-valve injector gives better fuel atomization and eliminates after dribble, both factors to improve specific fuel consumption. Electro-Motive developed, the new injector is standard on all 567D engines. It is also applicable to earlier General Motors 567 series engines and present spherical valve type injectors can be converted to the new type.

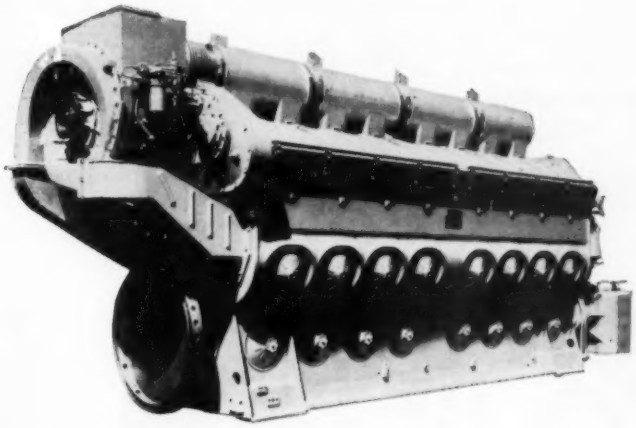
567D-1
Normally Aspirated

1800 tractive horsepower. 20:1 compression ratio. 16-cylinders. First used in the General Motors GP-18 and SD-18 locomotives. 12-cylinder version is used in the new General Motors RS-1325 locomotive.



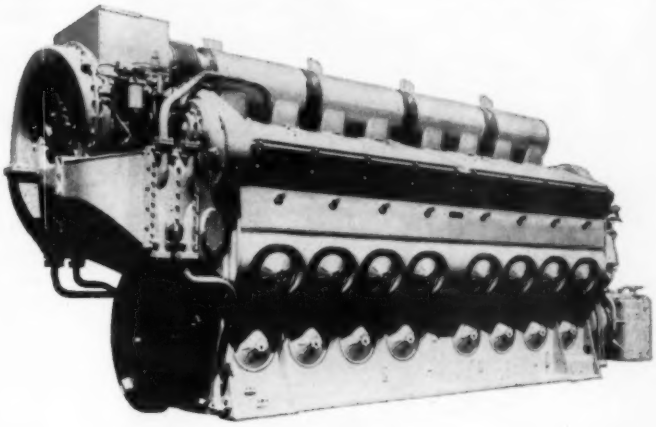
567D-2
Turbo-charged

2000 tractive horsepower. 14½:1 compression ratio. 16-cylinders. First used in the General Motors GP-20 locomotive.



567D-3
Turbo-charged

2400 tractive horsepower. 14½:1 compression ratio. 16-cylinders. First used in the General Motors SD-24 locomotive and MU-60 peaking plant.



ELECTRO-MOTIVE DIVISION · GENERAL MOTORS

La Grange, Illinois *HOME OF THE DIESEL LOCOMOTIVE*

In Canada: General Motors Diesel Limited, London, Ontario

TALKING SHOP . . .

(Continued from page 28)

knowing what's right, having tooling capable of the required accuracy and, probably most important, having good men. We're very fortunate in our personnel.

"We've tried to make the jobs attractive so as to hold our men. Nothing disrupts production and, in the long run, costs as much money as personnel turnover. The average length of service here is about 10 years. We think a lot of our people."

Our thanks to Mr. Torgis, both Senior and Junior, for these ideas on what makes "Precision Engine Rebuilders" tick. Boiled down, key points are:

1. Stay on top of your industry—its techniques and thinking. One good way is through "give and get" with its associations.

2. Invest in accurate, fast modern tooling.

3. Get, train and hold good men.

NAME _____

ADDRESS _____ DATE RECEIVED

SHIP TO _____

MAKE | MODEL | CUSTOMER'S ORDER NO. | DATE SHIPPED

		TORGIS SHOP OPERATIONS	LIST PRICE	NET PRICE
	A1	DISMANTLE AND CLEAN		
	A2	REMOVE AND REPLACE SLUDGE PLUGS AND CLEAN OIL HOLES IN CRANKCASE AND CRANKSHAFT		
	A3	PRESSURE TEST BLOCK HEAD		
	A4	REPAIR CRACKS		
	A5	STRAIGHTEN CRANKSHAFT		
	A6	MAGNIFLUX		
	A7	GRIND JOURNALS ON CRANKSHAFT		
	A8	ROUGH GRIND METALIZE & GRIND		
	A9	REFINISH CYLINDERS		
	B1	RESLEEVE CYLINDERS		
	B2	GRIND PISTONS		
	B3	EXPAND PISTONS		
	B4	REBUSH RODS, FIT PINS, ALIGN RODS		
	B5	RESIZE CONN. ROD FORGINGS		
	B6	FIT MAIN BRGS. TO CASE, ALIGN BORE AND FIT SHAFT		
	B7	INSTALL CAM BRGS., ALIGN BORE AND FIT SHAFT		
	B8	STRAIGHTEN AND GRIND CAMSHAFT JOURNALS		
	B9	GRIND LOBES ON CAMSHAFT		
	C1	REMOVE AND REPLACE VALVE GUIDES		
	C2	INSTALL VALVE SEATS		
	C3	REFACE VALVES SEATS TAPPETS		
	C4	ASSEMBLE VALVES AND SPRINGS IN HEAD		
	C5	REBUILD ROCKER ASSY.		
	C6	SURFACE HEAD BLOCK MANIFOLD		
	C7	MACHINE BRAKE DRUMS		
	C8	REBUSH AND FIT AXLE KNUCKLES ASSEMBLE		
	C9	REGEAR SURFACE FLYWHEEL		
	D1	REBUILD CYLINDERS		
	D2	TOTAL LABOUR		

One of Torgis shop worksheets. Number of items indicates extent of work this shop does.

NEW . . .
from Manzel
FLOW-actuated alarm
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LUBE-LINE ALERT
MODEL 3057-B
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LUBE-LINE ALERT gives positive protection to valuable compressors, engines, machinery and other equipment using force feed lubrication. Small, compact precision-made FLOW alarm inserts into oil lines near each terminal point.
• Fits any make of lubricator
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• Flow capacities from ½ cc to 2 qts/min.
• Handles any viscosity oil or synthetic
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TO A Minimum
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Consistently laps to flatness within .0000116" and finishes of 2 to 3 RMS.
No down time for truing lap plate . . . conditioning rings automatically keep plate flat and true.
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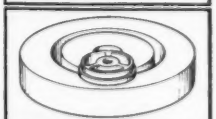

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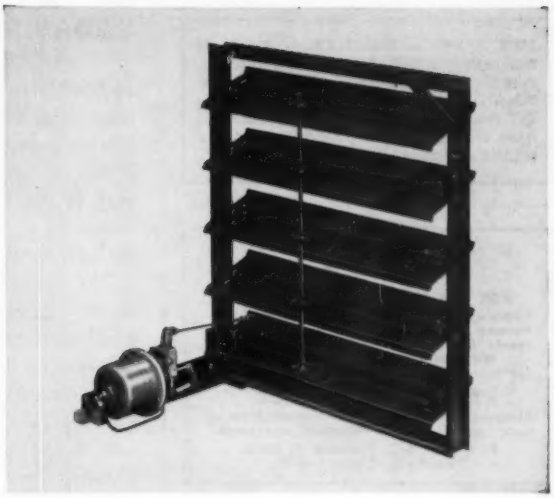

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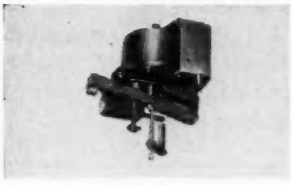
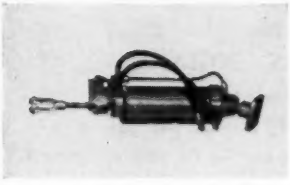


Grad-U-Motor shutter motor. Three sizes, for operating up to 48 sq. ft. of shutter area.



Heavy-duty, piston type ***Grad-U-Motor.*** For operating up to 96 sq. ft. of shutter area.

Air-O-Motor diaphragm motor. Three sizes, for operating up to 310 sq. ft. of shutter area.

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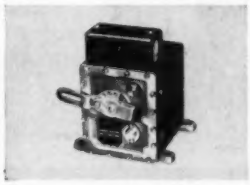
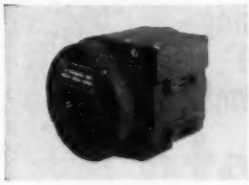


Modutrol motor operates up to 70 sq. ft. of shutter area.



Actionator operates up to 100 sq. ft. of shutter area.

Series 831E Industrial Motor operates up to 370 sq. ft. of shutter area.

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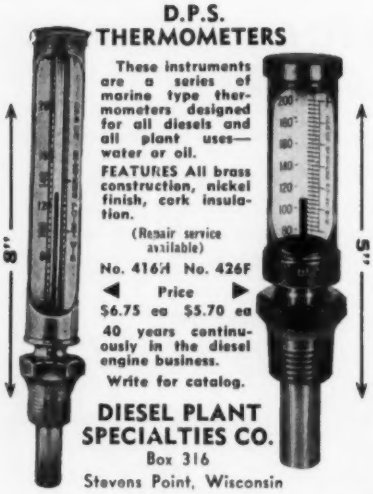

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TODAY'S DIESEL MAN

(Continued from page 31)

of trouble isn't the way. We like to track a problem down and be sure that we've found the *real* cause. Often it can be what seemed an unrelated part. It might mean a simple adjustment—or it might mean replacing the part throughout the fleet.

"As far as parts are concerned, we have to keep our eye on that old economic factor. Frankly, if we can buy surplus stocks of engine parts, or even some used parts in good condition, we'll do it. I think that in general, factory parts prices in the diesel industry are unnecessarily high. Which, of course, explains why many fleet owners get into this 'parts' situation."

Mike's parts man, Adam Reifenhauser, broke in here with this remark. "Economy is a big factor, but the cheapest isn't necessarily the best. This works two ways. One consideration is delivery time. A jobber that can get me a price maybe can't deliver. Then again cheap parts or products may not give us the service life we have to get."

"We deal with dependable jobbers. That way we don't have company equipment sitting out there on the shop floor where it can't earn a dime. We buy standard items and get the service life we pay for."

Mike told us that he decides what to buy and has his parts man get it for him. "He knows purchasing. I know the equipment and what it will do."

Today's Diesel Man . . .

Mike Galdiero is representative of an important element in the diesel industry—the maintenance superintendent. In reporting his story we are establishing several extremely significant points—

- His knowledge and ability keep diesel equipment rolling — working for the company full time.
- He is the man who decides what to buy—by item and by brand and he has to be sold first.
- He is the key to an efficient and economically-run diesel operation through his combination of skills and product knowledge.

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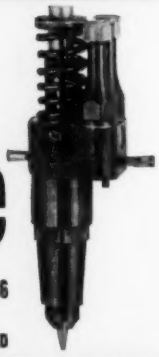

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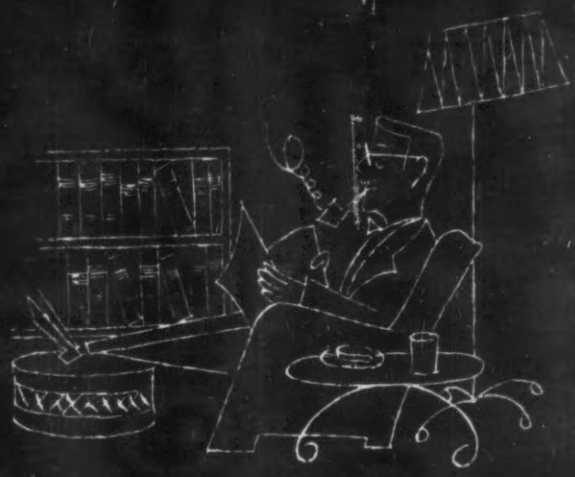

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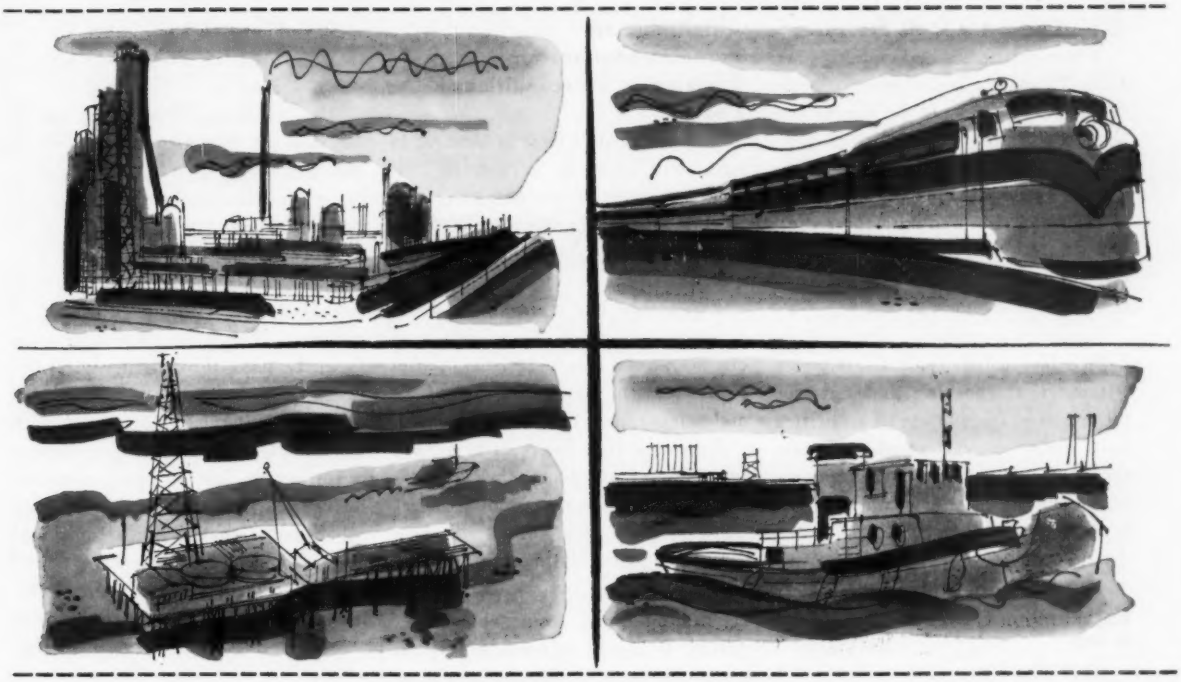

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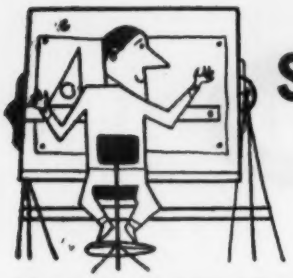


service section

Recent engine and equipment modifications, procedures and recommendations straight from the different manufacturers to you

G.M. Converter Stall Pressures

Whenever Series 200 or Series 300 G.M. Torqmatic converters are being serviced, they should be checked to determine if the minimum stall pressures of 15 and 25 psi prevail in the respective converters. Oil outlet orifices designed to maintain these pressures by restricting flow of oil from the converter are available for each converter housing.

Under no circumstances should an orifice be installed in a converter without first checking the converter oil pressure. Installation of an orifice in a torque converter which meets specified oil pressure requirements will result in excessive converter oil pressure and will damage or "blow" the oil seals.

Allis-Chalmers Recommendations for Breaking-in a Reconditioned Engine

You can protect your investment in parts and labor in a reconditioned engine through proper break-in.

Let's take an engine that has been reconditioned according to acceptable practice.

Experience has shown that dynamometer run-in of a reconditioned engine is the most beneficial. Accurate control of engine rpm, load and temperature can be maintained.

Following time intervals may vary from one engine to another depending on make, size and amount of rebuilding done. But they will give some idea as to the time required.

¼ hour at 10% rated hp
¼ hour at 20% rated hp
¼ hour at 25% rated hp

The following three hours should be run by progressively increasing the load every 15 minutes so that at the end of this period the engine will be producing rated horsepower at rated rpm.

During this run-in period a mild detergent type engine lubricant is preferred. This type oil can be satisfactorily used throughout the entire break-in period, and then, a higher detergency oil used in accord with the manufacturer's recommendations.

During the last ¼ hour operation the engine should be run at full rated load so that all adjustments and controls can be checked.

Oil pressure and engine temperature should be noted and recorded.

Intake manifold pressure, (or vacuum if not supercharged), exhaust manifold pressure and temperature are 3 important items. They should be noted even though the rated hp has been obtained in the final stage run.

At the end of the run-in period any discrepancies noted should be corrected. Cylinder head bolts (or nuts) should be torqued to specification and valve lash checked and reset to proper clearance.

The dynamometer operation does not constitute a complete break-in of the engine. After the engine has been installed in the unit, it should be operated according to the manufacturer's instructions. After this interval of operation, the engine oil and filter elements should be changed using the specified lubricant for the type of operation that will predominate.

If neither a dynamometer or run-in stand is available so that the engine is immediately installed in the unit, the engine should be operated

Resurfacing Cummins Cylinder Heads

Requests for "worn-replacement limits for resurfaced Cummins cylinder heads" or "how much metal can be removed safely from the cylinder head surface?" indicate that some shops are resurfacing cylinder heads as a general practice at engine overhaul. This is not necessary nor desirable.

Tests at factory show that JC cylinder head that is "warped" as much as 0.019-in. will flatten out with as little as 30-lb ft torque on head nuts. This shows why it is unnecessary to resurface heads because of "warping" only.

Of course, if the head surface has been scratched, etched or worn unevenly at point of contact with gasket sealing areas, resurfacing is required. It is seldom necessary to remove more than 0.006-in. material at one time, and approximately 0.030-in. should be considered maximum during life of head.

Overall height of cylinder head from head gasket surface to rocker housing surface can be used as a reference dimension. New and minimum dimensions after resurfacing are given.

When resurfacing a cylinder head:

1. Install new injector sleeves to maintain correct injector tip protrusion
2. Check overall height of assembled valve springs
3. If necessary install spacers under springs to obtain correct assembled height.

Engine Model	New Cylinder Head Height	Minimum Dimension After-Resurfacing
J, JS, JT	5.000	4.970
H (S), NH(S), NVH(S), VT	5.500	5.470
L & LR (to head gasket surface)	7.500	7.470
L & LR (overall)	7.687	7.657

with no load for one or two hours after which all adjustments are checked and reset. This is assuming that the engine has been up to normal operating temperature for a minimum of ½ to ¾ hours. When this method of break-in is used the engine should be operated at less than full-load capacity for a few hours more than had the engine been run-in before installation to give all moving parts a better chance to seat uniformly.

Cummins J Series Valve Assembly

New straight-tube valve guides (without shoulder) and new valve spring guides are used in all Cummins J series engines. Valve spring guide fits over valve guide and against cylinder head to provide a seat for valve spring.

Old- and new-style guides can be mixed in an engine, but should not be used under the same crosshead on JN, JNS, and JT engines.

On J, JF, and JS engines, valve guide driver ST-475 contacts cylinder head leaving guide at correct assembled height, 1.405 to 1.435-in. above head surface. On JN, JNS, and JT engines, valve guide driver ST-472 positions guide 1.240 to 1.260-in. above head surface.

The new valve assemblies were used first in JT Engine Serial No. 178024, and in all J, JF, and JS engines after Serial No. 168600.

Connecting Rod Assemblies for Cummins NVH, VT-12 Engines

Precision-balanced conrod assemblies are now used in NVH, NVHS and VT-12 engines. These rods are weighed and balanced at both crankpin and piston-pin ends within tolerances that permit complete interchangeability between engines.

This change decreases rod weight and prevents use of new rods in engines with "old-style" rods. New rod assemblies are available as BM-37596 and must be used in complete sets. In addition to new part number, new style rods can be identified by:

A. Forging number 101155 on each rod

B. Code letter "E" stamped on the piston-pin end balance lug. Code letter indicates rod weight in case additional classes of rod weights are released at later date. Total weight of Class "E" rod with piston pin bushings, bolts, nuts and washers is 12.465-12.515 lbs.

Use old-style BM-26966 rods to service engines now in use where fewer than a complete set are installed. Old style rods will continue to be available as service parts.

New-style rods (BM-37596) were used first in NVH, NVHS and VT-12 engines beginning with serial No. 150101.

GM Recommendations for Plastigage Method for Checking Bearing Clearances

For quite some time, the Maintenance Manuals published by General Motors Diesel have suggested the use of a plastic type gauge for checking the clearances of main bearings and connecting rod bearings. Here is detailed information on the Plastigage method for checking clearances.

Plastigage is a specially molded plastic "wire" manufactured by Perfect Circle Corporation. It is available in three sizes and colors:

Type PG-1 (green) has a clearance range of 0.001 to 0.003.

Type PR-1 (red) has a range of 0.002 to 0.006.

Type PB-1 (blue) has a range of 0.004 to 0.009.

Instructions prepared by the Perfect Circle Corporation best describe the Plastigage method for checking bearing clearances and out-of-roundness.

1. Remove the bearing cap and wipe the oil from the bearing insert and crankshaft journal.

(When checking main bearing clearances with the engine in a position where the main bearing caps are supported the weight of the crankshaft and the flywheel, an erroneous reading due to the weight of the crankshaft and flywheel can be eliminated by supporting the weight of the shaft by means of a jack, or by placing a thin rubber pad between the main bearing or bearings adjacent to the one being checked.)

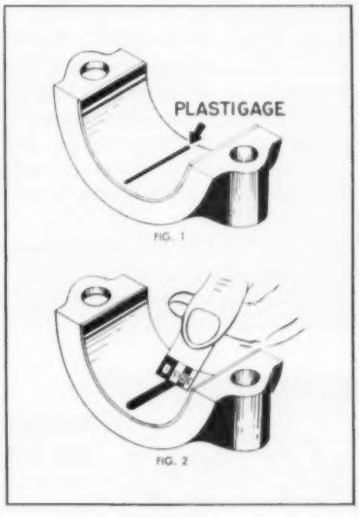
2. Place a piece of Plastigage the full width of the bearing insert about ¼-in. off center, as illustrated. (Fig. 1).

3. Rotate the crank about 30 deg from bottom dead center and reinstall the bearing cap. Tighten the bolts with a torque indicating wrench to specification.

4. Remove the bearing cap. The flattened Plastigage will be found adhering to either the bearing shell of the crankshaft.

5. Compare the width of the flattened Plastigage at its widest point with the graduations on the envelope, as shown in the drawing. The number within the graduation on the envelope indicates the bearing clearance in thousandths of an inch. Taper may be indicated when one end of the flattened Plastigage is wider than the other. Measure each end of the flattened Plastigage. The difference between readings is the approximate amount of taper. (Fig. 2).

Out-of-roundness, can be approximately determined with Plastigage as well. Place a strip the complete curved length of the lower bearing shell and reinstall the cap. The difference between the maximum and minimum indicated clearance is the approximate out-of-roundness.



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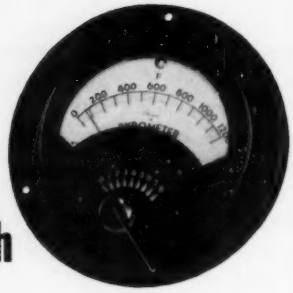

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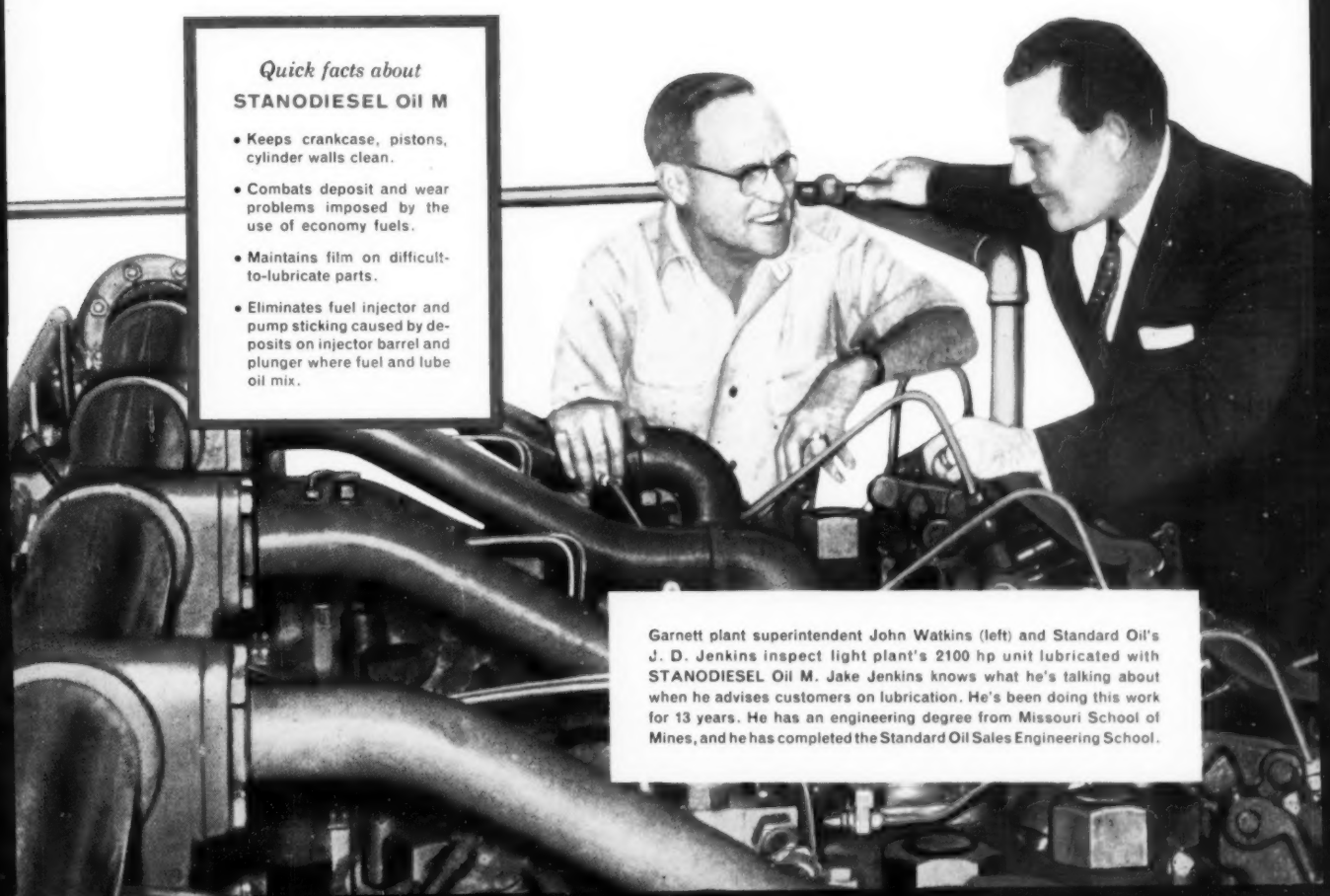
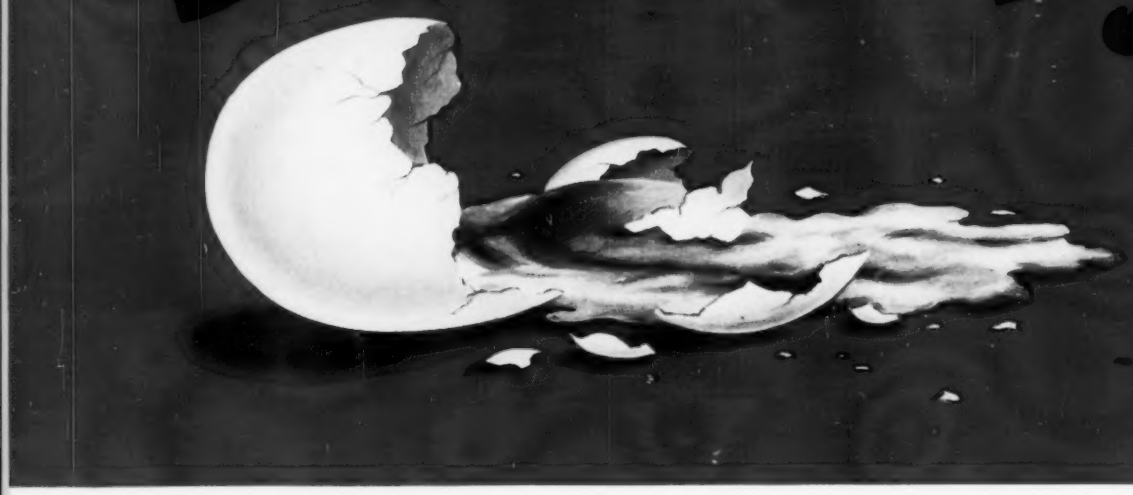
- Maintains film on difficult-to-lubricate parts.
- Eliminates fuel injector and pump sticking caused by deposits on injector barrel and plunger where fuel and lube oil mix.



Garnett plant superintendent John Watkins (left) and Standard Oil's J. D. Jenkins inspect light plant's 2100 hp unit lubricated with STANODIESEL Oil M. Jake Jenkins knows what he's talking about when he advises customers on lubrication. He's been doing this work for 13 years. He has an engineering degree from Missouri School of Mines, and he has completed the Standard Oil Sales Engineering School.

BREAKAGE?



Sealed Power Cyclan Piston Rings do not break in severe service where other rings have failed!

All Sealed Power diesel sleeves and sleeve assemblies are designed and manufactured with extreme care in a modern plant built and devoted exclusively to their manufacture. For top performance, all parts are engineered to work together, and subject to rigid quality controls.

If you have encountered trouble with • **breakage** • **excessive heat** • **side wear** • **friction**

Cyclan may be the solution. Cyclan is a special alloy iron for diesel applications developed by Sealed Power metallurgists. Cyclan has far greater strength and resiliency than standard ring irons. It is chrome-plated for longer life and superior oil control.

Sealed Power engineers will be glad to discuss your application or problem. Please write or phone.

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